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FUEL ECONOMY TESTING, LABELING AND INFORMATION DISCLOSURE PROCEDURES AND REQUIREMENTS

1977 and Later Model Year Automobiles

Title 40—Protection of Environment

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

[FRL 635-8]

PART 600—FUEL ECONOMY OF MOTOR VEHICLES

Fuel Economy Testing, Labeling and Information Disclosure Procedures and Requirements for 1977 and Later Model Year Automobiles

The Environmental Protection Agency (EPA) is hereby promulgating regulations which require manufacturers of 1977 and later model year automobiles and light trucks to label each vehicle with fuel economy information. The regulations set forth the form and content of the labels and prescribe the manner in which vehicles will be selected and tested for the generation of fuel economy information. This rule making also contains requirements for dealers of these vehicles to maintain the labels on the vehicles and to have copies of a pamphlet, The Gas Mileage Guide, in their showrooms in which prospective purchasers will be able to find the fuel economies of the various models of these vehicles offered for sale in a given model year. This pamphlet will be prepared by EPA and the Federal Energy Administration (FEA) and distributed by FEA.

These rules were the subjects of a Notice of Proposed Rule Making (NPRM) published in the FEDERAL REGISTER on May 21, 1976 (41 FR 21002). The rules are required by Title V of the Motor Vehicle Information and Cost Savings Act, 15 U.S.C. § 1901 et seq. (hereinafter "the Act") which was enacted as Title III of the Energy Policy and Conservation Act, Pub. L. 94-163, 89 Stat. (901) (December 22, 1975).

Synopsis of regulatory provisions. The regulations require that all new automobiles,[1] at the time they are offered for sale, carry a label disclosing the fuel economy of the vehicle, the average annual fuel cost for operating the vehicle, and the range of fuel economy estimates for comparable automobiles. Manufacturers are required to affix and dealers are required to maintain the labels on the automobiles. All automobiles offered for sale must be labeled, although the range for the label will not be available until approximately October. (Until October, there will not be enough test data available to create meaningful ranges). Vehicles sold before range values are available will state on the label that no range was available at the time the label was affixed.

The format and content of the label is illustrated by example in an Appendix to the regulations. The labels in the Appendix illustrate the explanatory language which EPA expects to be included on the label. However, EPA will review and approve each manufacturer's proposal for a label format, and the manufacturers have reasonable latitude in the specific design and language of their labels, as long as the labels effectively convey the information shown on the samples. For 1978, EPA may consider changes to the sample labels to improve consumer comprehension, such as the use of graphics on the label.

The NPRM solicited public comment concerning the form and content of the labels and concerning the test procedures and test requirements proposed for the development of fuel economy data. Additional comment was requested on the effect of proposed requirements for the use of "specific labels", (i.e., that such labels be used uniformly within a "model type"), the procedures for determining the classification of vehicles into categories of "comparable vehicles," and the criteria proposed for EPA determinations of the acceptability of manufacturer-generated test data.

Some of the regulatory requirements which were the subject of the NPRM of May 21, 1976, have already been promulgated. Certain provisions which are essential for the measurement and calculation of manufacturers' fuel economy averages under section 503 of the Act were originally published as part of this rulemaking since these provisions also relate to the measurement of fuel economy for labeling purposes. The promulgation of these provisions could not await this Notice of Final Rule Making since they are subject to a statutory deadline in section 503 of the Act. Consequently, they were published on September 10, 1976 in the Notice of Final Rule Making pertaining to the calculation of manufacturers' average fuel economies. See, Title 40, Chapter 1, Part 600—Fuel economy of motor vehicles, Fuel Economy Testing for 1978 Model Year Automobiles and Calculation Procedures for 1977 and Subsequent Model Year Automobiles; Exhaust Emission Test Procedures for 1978 Model Year Automobiles and Light Duty Trucks, 41 FR 38674.

Automobile dealers are required to make available, in their showrooms, copies of the current model year Gas Mileage Guide. EPA will compile the data for these guides and FEA will print and distribute the Guide. Manufacturers and dealers may also print guides themselves, providing that they are essentially the same as the EPA/FEA Guide. Dealers must display the Guide prominently, and keep a sufficient stock so as to allow retention of copies by consumers.

The regulations below fulfill the requirements imposed upon EPA by the Energy Policy and Conservation Act with respect to the labeling of 1977 and subsequent model year automobiles. EPA has consulted with the Department of Transportation, Federal Energy Administration, and the Federal Trade Commission, in the preparation of these rules as required by section 506 of the Act.

Detailed description of the action. The following sections of this notice describe in detail the action herein taken and note the major comments received and their disposition by EPA.

1. *Basic definitions.* Several key definitions are used throughout this preamble. An introductory discussion of the terms will aid in understanding the rules. All of the following terms are defined in the text of the regulations.

The Act requires that all automobiles be labeled with a sticker displaying fuel economy information. An automobile is defined as any 4-wheeled vehicle, propelled by fuel, which is manufactured primarily for use on public streets, roads, or highways and which has a gross vehicle weight rating (GVWR) of 6000 pounds or less. This definition includes types of cars and trucks which are currently certified by EPA as "light-duty" and are included in the 1976 EPA/FEA Gas Mileage Guide for New Car Buyers. Present EPA certification regulations (40 CFR 86.077-2) define a light duty vehicle as a passenger car or passenger car derivative capable of seating twelve passengers or less. A light duty truck is defined in the same regulations as being designed primarily for the purpose of transportation of property and having a 6000 pounds GVWR or less. Therefore, all light duty vehicles and all light duty trucks (as defined for emissions certification purposes) will be required to display a fuel economy label except those with a GVWR greater than 6000 pounds. (On February 12, 1976, EPA proposed rules extending the GVWR upper limit for light duty trucks to 8500 pounds beginning with the 1978 model year (41 FR 6279). Light duty trucks above 6000 pounds GVWR will be required to be labeled according to these regulations if the Secretary of Transportation promulgates rules applicable to these vehicles for some future model year.)

For fuel economy purposes, the first subdivision of a manufacturer's product line is car line. A car line denotes a group of vehicles within a make or car division which has a degree of commonality in construction. Car line does not consider any level of decor or opulence and is generally not distinguished by characteristics such as roof line, number of doors, seats or windows, although station wagons are considered distinct car lines from sedans. For example, in the 1976 EPA/FEA Gas Mileage Guide for New Car Buyers, Buick, a division of General Motors had listed nine car lines: Electra, Skylark, Opel, Century/Regal, Century Wagon, Lesabre, Estate Wagon, Skyhawk, and Riviera.

A subdivision of car line and the major level for labeling and reporting fuel economy is model type. A model type is defined as a unique combination of car line, basic engine, and transmission class. Thus, within a car line, a number of model types may exist depending upon the availability of various basic engines (displacement and number of cylinders, fuel system, and catalyst usage) and the transmission classes offered (automatic or manual). Each line entry in the Guide corresponds to a unique model type.

Although weight is not a model type determinant, it does figure into the cal-

[1] "Automobiles", for the purpose of the Act, include light trucks.

[2] The harmonic average fuel economy is computed by taking the inverse of average fuel consumption where consumption is expressed as gallons per mile.

culation of the fuel economy for each model type. For testing and calculation purposes, each manufacturer's product line is subdivided into base levels. A base level is a unique combination of inertia weight class, basic engine, and transmission class (the vehicle characteristics that most profoundly affect fuel economy). Note that base level is nearly the same as model type except that weight is substituted for car line. The fuel economy for any model type is simply the sales-weighted, harmonic average of fuel economy of each base level comprising the model type. Again using the Buick example, a typical base level would be 3500 pound, 231 cubic inch, 6 cylinder engine with 2 barrel carburetor, catalyst, and manual transmission.

Another level of delineation is used to identify individual test vehicles. Base levels are subdivided into vehicle configurations. A vehicle configuration is defined as a unique combination of inertia weight class, basic engine, and transmission class (all of which determine a base level) plus engine code, transmission configuration, and axle ratio. Engine code goes beyond the definition of basic engine by isolating different variations of carburetor, distributor, and other key engine and emission control system components. Transmission configuration considers more than just manual or automatic and distinguishes transmissions primarily by the number of forward gears, e.g., three-speed manual and four-speed manual. An example of a vehicle configuration is 3500 pounds, 231 cubic inch, 6 cylinder, 2 barrel carburetor engine and engine code 4, with catalyst, 4 speed manual transmission and 2.56 axle ratio.

II. *Fuel economy labeling.* The Act requires that manufacturers label (or cause to be labeled) each 1977 and subsequent model year automobile and that dealers maintain the label on the vehicle. Each label is required to indicate, (1) the fuel economy of the automobile, (2) the estimated annual fuel cost associated with the operation of the automobile, and (3) the range of fuel economy of comparable automobiles; all of this information to be determined according to rules prescribed by the Administrator. EPA is also responsible for specifying, by rule, the form and content of the labels and the manner in which they are affixed.

Label format. Appendix IV to these regulations provides samples of the label formats. Comments were solicited on the form, content, and language of the labels, and on the use of graphics on the label. Ford and General Motors responded, suggesting minor revisions to the sample labels.

EPA concluded that minor changes should be evaluated on an individual basis in the process of label approval so that a manufacturer may have some flexibility to individualize his own label. Therefore, without judgment as to the merit of the specified changes suggested by the manufacturers, the sample labels have not been changed from the NPRM for 1977.

Volkswagen commented that all of the explanation should be deleted from the label, including the vehicle description information. Although the labels contain considerable verbiage, deletion of this information would be greater disservice to the consumer than to publish it and risk confusion or deception, in the opinion of EPA and the consulting agencies.

Comments were also requested on the use of graphics on the labels. Ford and Mercedes Benz responded that space did not allow a comprehensive graphic description on the label. Furthermore, the increased complexity of the graphical representation would increase the cost of labeling.

The Office of Consumer Affairs responded critically to the sample labels and suggested graphic substitutes. However, some of the comments seemed to be directed at the labels in the NPRM in the May 21, 1976, FEDERAL REGISTER, which were misprinted. An errata notice was subsequently published on May 28, 1976 (41 FR 21719). Based on the comments, the regulations are being promulgated as proposed, allowing, but not requiring, graphic presentations. However, EPA is considering further the use of graphics for model years following 1977.

Types of labels. The labels are of two basic types, general and specific. The general label displays sales-weighted, fuel economy estimates for a model type—a unique combination of car line, engine displacement, number of cylinders, fuel system, catalyst usage, and transmission type (manual or automatic). A specific label contains the fuel economy of a unique vehicle configuration identified by a more detailed description of the engine (although not identified on the label), weight of the vehicle, axle ratio, and the number of forward speeds of the transmission.

Both general and specific labels list three fuel economy values: city, highway, and combined. The city fuel economy value is determined from operating one or more test vehicles over the driving schedule in the Federal Test Procedure (FTP) (also used to test for exhaust emissions) which simulates an average trip of 7.5 miles in an urban area at an average speed of just under 20 miles per hour. The city schedule consists of cold and hot engine startup segments with vehicle operation on a chassis dynamometer. The highway fuel economy value is measured by operating one or more test vehicles over the driving schedule in the Federal Highway Fuel Economy Test Procedure (HFET), which is designed to simulate non-metropolitan driving at an average speed of 48.6 miles per hour and a maximum speed of 60 miles per hour. The highway schedule consists of a hot-engine startup with the vehicle operated on a chassis dynamometer. The third value displayed is a combined fuel economy value which is the harmonic average of the city and highway fuel economy values, weighted 55 and 45 percent, respectively, to reflect Federal Highway Administration data on national driving patterns.

Specific labeling requirements. In prior years, manufacturers have been permitted to substitute specific labels for general labels on individual configurations without constraint. Manufacturers have used specific labeling to call attention to those vehicle configurations with above average fuel economy within a model type. EPA proposed in the NPRM that if a manufacturer chooses to utilize a specific label, he is also required to apply specific labels to all automobiles of the same model type (i.e., all those automobiles that would have been covered by a single general label). The agency proposed this requirement for the manufacturers to provide protection against deceptive advertising use of the EPA fuel economy estimates. Because of adverse industry comments and concerns from the FEA that specific labels would not be widely used if this requirement were imposed, EPA explored other alternatives to the proposed requirement.

Two types of alternative approaches were examined. The first type of approach would require specific labeling in the larger configurations within a model type. The two suboptions would require that x% of the model type be specific labeled by vehicle configuration ordered by decreasing sales volume, or that all configurations contributing more that y% of sales within a model type be specific labeled. These approaches suffer because they do not fully protect the consumer and they have the potential, as new configurations are added and sales projections change throughout the model year, for requiring as much testing as the EPA proposal.

The other type of approach attempts to insure that the worst car(s) are specific labeled if the best are. This may theoretically be done by specifying either that all cars which are more than x miles per gallon below the general label value must be specific labeled (if specific labeling is elected) or that a worst case car is specific labeled each time a better than average car is specific labeled. Although this approach may inform consumers of the worst fuel economy cars, it is not administratively workable since it is not always possible to identify the worst fuel economy vehicles a priori. Furthermore, the one-for-one suboption may even fail to alert consumers to the fact that some configurations may get substantially poorer fuel economy than the fuel economy leader because the worst car may never show up on dealer's lots.

All things considered, the EPA has found no alternative which is superior with respect to the goals of reduced test load and consumer protection, while still permitting specific labeling, than the option that was proposed. EPA is therefore requiring that after 15 days after fuel economy range information is made available, all configurations within a model type be specific labeled if specific labeling is chosen for any vehicle within the model type.

Model introduction period considerations. Several manufacturers expressed concerns regarding the impact of label-

ing requirements on model introduction and suggested various means by which the requirements should be relaxed during the first weeks of production. Some manufacturers requested that EPA provide a grace period during the first weeks of production during which either no labels would be required or no fuel economy values would be required to be put on the labels. One manufacturer suggested that EPA permit the use of preliminary fuel economy values on general labels during this early production period and permit the revision of these values later in the model year.

Two requirements in early drafts of these regulations were the principal sources of manufacturers' concerns in connection with the model introduction period. First, the requirement that labels include the range of fuel economy values for comparable vehicles would mean that no vehicles could be sold until enough manufacturers had completed fuel economy testing so that EPA could calculate meaningful ranges. It was argued that this would tend to tie manufacturers' introductions to one another, which would be anticompetitive and would be a disruptive departure from past industry marketing practices, and that such an impact was not intended by EPCA.

The second problem associated with the beginning of the model year is related to the requirement that a general label value be approved prior to the approval of specific labels within a given model type. This requirement provided the industry with two unpalatable choices at the beginning of the model year. Either a manufacturer would have to complete all required and voluntary fuel economy testing prior to the sale of the first vehicle, or he would be forced to restrict his early production to those vehicles for which general label values were available. (In the past, manufacturers only had to successfully complete the testing of their emissions certification fleet prior to production, and could complete fuel economy testing after production began.) Thus, this requirement would either delay the start of production or might seriously restrict the number of model types offered for sale near the beginning of the model year. This requirement might also have the effect of reducing the incentive for manufacturers to make early running changes (which often improve fuel economy) since the benefits from such changes would not be reflected in general label values, which do not change during the model year from the values approved at the beginning of a model year. Neither a delay of production (as noted earlier), nor a restriction of the types of cars offered for sale was intended by the Act.

The regulations resolve these problems by relaxing the requirement that general label values be approved prior to the use of specific labels at the beginning of the model year and provide that ranges will not be required to be included on fuel economy labels until a reasonable time after all of the general label values which will be included in the first edition of the *Guide* have been disseminated to the industry. EPA is requiring that labels on cars imported or manufactured 16 or more days after the fuel economy ranges are made available show the applicable value for the range. Since the bulk of general labels will be approved by this time, this is also the time that EPA will impose the requirement that specific labels be used for all configurations within a model type or general labels be used.

One manufacturer did not find these changes to the draft regulations entirely satisfactory. Due to this manufacturer's particular marketing strategy, a very large number of configurations were planned to be put into production at the beginning of production (whereas most manufacturers apparently begin production mainly with the most popular configurations). Consequently, the use of specific labeling for these vehicles would entail a large volume of testing that was not easy to perform in the time available. This manufacturer suggested that EPA accept the use of "interim" label values which would be amended and replaced by "final" values after he had completed all fuel economy testing. Since these interim label values would not include test data from early running changes or from voluntary fuel economy data vehicles (submitted to offset the effects of test data from "worse case" emission data vehicles), interim values would be lower than final values.

EPA rejected the use of such interim values for several reasons. First, the values on these labels would be different from values in the Mileage Guide. This would be unnecessarily confusing to the public. Second, the use of such values would result in two identical model types appearing with different fuel economy values. Once again, public confusion would result. Finally, since the interim values would be invariably lower than the final values, the credibility of the values would be diminished in the eyes of the public. These effects would result in decreased public acceptance and use of the fuel economy information provided by the labels and Mileage Guides which would be inconsistent with the intent of the Act.

The granting of a blanket grace period was rejected by EPA as unauthorized by the Act and contrary to both the intent of the Act and the public interest.

Fuel cost estimate. Every label will display an average annual fuel cost estimate based on the combined fuel economy that appears on that label. The EPA Administrator will, with assistance from the Secretary of Transportation and the Federal Energy Administrator, determine the proper values for the average annual mileage for a new car and the average cost of fuel respectively, and will advise the affected manufacturers of these values.

Neither the fuel economy values nor the average annual fuel costs initially determined for a general label will be revised during the course of a model year. However, on specific fuel economy labels, both the fuel economy figures and the annual fuel cost estimate will be updated to reflect any mid-year production modification that creates a new vehicle configuration.

Fuel economy range. The Act specifies that fuel economy labels contain the range of fuel economy of comparable automobiles. This range will be the range of the city/highway combined fuel economy values for all model types included within a class.

All vehicles within a car line (or truck line) will be grouped into a single class. (Station wagons will constitute a separate car line.) One distinct range will be calculated for each class for use on both general and specific labels. The range will consist of the highest and lowest combined fuel economy results of all model types within the class, i.e., the range of the general label values within the class. Since the fuel economy booklet is the primary source of comparative vehicle fuel economy information and lists general label values, it is desirable that other sources of information, such as the label range values, be consistent. Additionally, for those vehicles included in a published edition of the fuel economy booklet, a consumer will be able to compare the fuel economy values of other model types of the same class and other classes.

EPA recognizes that regardless of the approach adopted for establishing the range of fuel economy values used on labels, there can be some degree of confusion for the potential car buyer. For example, if the range were to be based on specific label values, potential car buyers would have no practical way to ascertain which vehicles represent the extremes of the range since this information cannot readily be kept up-to-date and published in current booklet form. Conversely, if ranges are based on general label values, vehicles that are specific-labeled could show fuel economy values outside of the range. EPA has concluded that less confusion will result from using the latter scheme, and will explain in the fuel economy booklet why some specific-labeled vehicles may show fuel economy values outside the range given on the label. Therefore, the range values will be based upon model type (i.e., general label) combined fuel economy figures for all automobiles determined to be in the same class.

Classification of vehicles. The Agency considered three basic issues relating to vehicle classification:

1. How many classes should there be and what dividing lines (cut points) should be employed between the classes?
2. Should the classes have discriptive names or be designated by a number or letter?
3. On what basis should car lines (and truck lines) be assigned to a class?

EPA concluded that a system that groups automobiles into a relatively small number of classes is most desirable. Too few classes have the effect of grouping too many dissimilar cars together and would not provide meaningful comparative information. On the other hand, a large number of classes is tantamount to putting each vehicle in its own unique class, which frustrates the purpose of putting the range on the label.

Regarding the names of the classes, there are advantages to both approaches posed in question 2 above. The Agency sees merit in a scheme that uses descriptive terms that consumers generally understand. For example, passenger automobiles might be designated as "subcompact", "compact", "intermediate", "full-size", or "sports/specialty". For light trucks, common categories are "small pickup", "standard pickup", and "utility/special purpose". These classes are often used by trade publications, industry associations, and consumer testing organizations to identify vehicles. However, the disadvantage of using such names is that the class into which a vehicle is grouped for fuel economy labeling purposes may differ from the marketing intentions of the manufacturer. EPA wants to avoid any interference with manufacturer's marketing efforts. For this reason, EPA noted in the NPRM that there may be some advantage to identifying the classes by using numbers or letters (e.g., "1", "2", or "A", "B"). Comments to the NPRM were almost evenly split with half the respondents supporting usage of descriptive names due to their greater consumer identification while others were against this usage due to the potentially great and inappropriate marketing impact of the resulting vehicle identification. In order to minimize EPA's intrusion into the manufacturer's marketing schemes and still achieve some consumer recognition, EPA will, to the extent possible, use simple, descriptive names for vehicle classes.

Concerning the third issue, the basis for class determination, EPA could find no commonly accepted, objective criterion by which vehicles could be grouped into categories. Although the majority of existing classification systems are related to vehicle size, classification is apparently determined subjectively based largely on the "marketing intent" of the manufacturer, or his intent as it may be perceived by some other classifying organization. It is not acceptable, in the Agency's opinion, to employ subjective evaluations for class assignments even if an objective approach may appear to misclassify a small number of vehicles.

EPA has examined several methods for objectively categorizing automobiles into classes. A primary consideration in evaluating any alternative approach was that the method be consistent with the proposed labeling scheme (i.e., general and specific) to the extent that no proliferation in the number of labels results. For example, a general label frequently includes automobiles in more than one weight class. Consequently, a method of defining classes of vehicles based on weight would necessitate that either more than one range appear on a single general label or that multiple versions of the same general label be used. Also, using weight as a criterion would provide little consumer information, because few people are believed to buy cars by weight.

In the NPRM, EPA had identified several basic types of vehicles: conventional passenger cars (generally designed to carry at least four persons and a moderate amount of luggage), station wagons (generally designed to carry at least 4 passengers and a large amount of luggage or property), sports passenger cars (normally designed to carry only two persons and a limited amount of luggage), luxury passenger cars (designed to carry anywhere from two to six persons, but costing significantly more than the average consumer normally considers on spending for an automobile), pickup trucks (distinguished by limited passenger capacity and an open cargo bed), vans and a number of other utility or special purpose light duty trucks. EPA concluded that, if administratively possible, vehicles should be objectively grouped in a manner consistent with these basis types of vehicles. The NPRM specifically requested comment on this issue of grouping comparable vehicles into classes.

Almost all manufacturers agreed that an approach that grouped automobiles according to basic design should be used. Most further concurred with the EPA proposal to further subdivide conventional cars according to size. A significant number of adverse comments were received, however, on the proposed separate classification of luxury passenger cars on the basis of a base price of $15,000 or more. It was generally agreed that the $15,000 cut point is arbitrary, has little or no relationship to fuel economy, and would likely have to be continually revised in order to consistently group specific vehicles. Consequently, EPA has decided to drop any consideration of luxury vehicles as a separate class and consistently group vehicles according to design or measurements of size or usefulness.

Light duty trucks will be divided into small pickup trucks, standard pickup trucks, and van/special purpose trucks as proposed. The cut point between the small and standard classes of pickups will be made at 4,500 pounds GVWR. Comments suggested that wheelbase length was not an acceptable discriminator in that it has little relationship to overall or interior vehicle size, cargo capacity or vehicle usefulness and would not be readily understood by consumers. Although one manufacturer suggested that vans be separately categorized on the basis of enclosed cargo volume, this would not adequately separate true van-type trucks from other enclosed light duty trucks and will therefore group these vehicles together in a single class.

Conventional passenger cars are more difficult to classify since there are so many variations and they are continually changing from year to year. EPA and FEA analyzed several different methods for classifying passenger cars. Two approaches were proposed in the NPRM. One approach, classification of cars on the basis of wheelbase length, was not supported by any of the comments and was dismissed by EPA because it did not properly class downsized future product lines. The other approach, termed the "volume" approach, was strongly supported by comments and is compatible with the space and weight conscious design of future product lines. As proposed, the volume approach utilized a combination of interior and exterior volume indexes. However, upon reconsideration of all of the issues involved, EPA has concluded that the approach used should be based, to the greatest extent possible, on a measure of vehicle utility rather than being based on factors which may be influenced primarily by styling considerations and which do not closely correlate with the basic passenger and luggage carrying ability of the vehicle. The exterior volume index does not fit this new criterion. It is entirely possible to change any of the three dimensions that make up the exterior volume index (length, width or height) without affecting the utility of the vehicle. Moreover, it is also possible to significantly increase a vehicle's utility without changing any of those dimensions. Therefore, EPA is using the interior volume index that was discussed in the NPRM as the sole basis for the classification of passenger automobiles into comparable classes, except two seaters.

In order to make this interior volume scheme as simple and manageable as possible, EPA will group all passenger automobiles (other than station wagons) into five classes:

Two-seaters—cars required to be equipped with only two seat belts,
Subcompact cars—cars with interior volume indexes of less than 100 cubic feet,
Compact cars—cars with interior volume indexes from 100 to less than 110 cubic feet,
Mid-size cars—cars with interior volume indexes from 110 to less than 120 cubic feet, and
Large cars—cars with interior volume indexes equal to, or greater than, 120 cubic feet.

Similarly, for station wagons, the classes and cut points are to be:

Small station wagons—station wagons with interior volume indexes of less than 130 cubic feet,
Mid-size wagons—station wagons with interior volume indexes of 130 to less than 160 cubic feet, and
Large station wagons—station wagons with interior volume indexes equal to, or greater than, 160 cubic feet.

This scheme does not represent a great departure from the volume approach originally proposed. However, the Agency does see this modification as an improvement to the overall concept, since the deletion of the exterior volume index removes the sensitivity of the classification scheme to minor or purely cosmetic changes in vehicle exterior dimensions which do not influence vehicle utility.

The calculation of the interior volume index is identical to the proposal in the NPRM (as modified version of the Society of Automotive Engineers (SAE) Recommended Practice J1100a). In addition, the regulations include procedures for the calculation of the usable luggage capacity of two-passenger vehicles, which is not expressly considered by the SAE procedure.

The fuel economy booklet which dealers must stock in their showrooms, (i.e., the Guide) will designate the class for each model type listed. In addition, the booklet will include the passenger/

cargo-luggage volume for each model type as an aid to consumers in the selection of fuel efficient/utilitarian vehicles.

Updating of fuel economy range information. The NPRM proposed that at the beginning of each model year, EPA would issue fuel economy ranges for each class of comparable vehicles as soon as enough data had been collected to calculate meaningful ranges. EPA would update these ranges during the model year if additional data on newly introduced model types made the original ranges unrepresentative. For the 1977 model year, the original issue date for the range was September 17, 1976. In each case, manufacturers would be required to include the most current range on labels affixed to automobiles manufactured or imposed after 15 calendar days following receipt of the data. Automobiles manufactured or imported before the first range is available will be required to contain language on the label stating that no fuel economy range was available as of the date of production or importation. EPA requested comments on the appropriateness of this procedure, and on the specific time period involved.

Most manufacturers supported the basic updating procedure if it were limited to a reasonable number of times within the model year. As noted in the Preamble to the NPRM, it is expected that the range will only be updated once in one model year. However, some manufacturers commented that 15 days were not sufficient lead time in order to implement a change to the label information such as addition or change of the range of fuel economy of comparable vehicles. Rather, they indicated that a minimum of from 30 to 60 days was absolutely necessary. The Agency appreciates the significant burden imposed on manufacturers under a time limitation of 15 days to change label range information. However, allowing 30 to 60 days to implement required label changes would result in a significant number of vehicles being labeled without the latest, correct fuel economy information. The Agency has determined that such proliferation of misinformation is not in the best interests of the public. The final regulations are promulgated as proposed with a 15-day time limit for updating the label range values.

One foreign manufacturer pointed out that under this provision of the proposed regulations, a vehicle labeled in the home country during assembly but arriving in the U.S. twenty days later could be required to be relabeled with an updated range. EPA did not intend to place such an additional labeling burden on foreign manufacturers. Therefore, this section of the regulations has been changed for final rule making so as to require only that vehicles manufactured 16 days after the new range is made available incorporate that updated range on their fuel economy labels.

III. *Booklet availability.* Automobile dealers are required, beginning with the 1977 model year, to make available to prospective purchasers the booklet containing fuel economy and estimated fuel cost information. For each model year, EPA will transmit to the Administrator of the Federal Energy Administration a copy of the booklet suitable for reproduction, with the first edition expected to be available about the end of October. A second edition will be prepared in February which will include all model types certified after the compilation of the first edition. FEA will reproduce the booklets and make copies available to automobile dealers and other interested parties. Other parties may also reproduce the booklet for purposes of satisfying these requirements. Therefore, a description of the ways in which copies may deviate from the FEA-printed booklets are also included in the regulations. Since delivery of the booklets to the dealers is within the control of FEA and not the dealers, no firm calendar date is set for the initial availability to consumers.

EPA intended to include in the NPRM that the booklet would also identify vehicles considered within a specific comparable class. However, this item was omitted from the NPRM but is being included in the final regulations.

IV. *Fuel economy data vehicles.* Fuel economy data vehicles are those vehicles, in addition to emission certification vehicles, which are tested to measure fuel economy for the purposes of including the results in the booklet for labeling or to calculate manufacturers' fuel economy averages.

Fuel economy data vehicles may either be required or may be optional depending on the situation. For example, in a case in which additional data are necessary to calculate the manufacturer's general label values, fuel economy data vehicles are required. On the other hand, a manufacturer may voluntarily submit data from additional vehicles for use in calculation of specific labels or to supplement the minimum data base required to calculate a general label fuel economy value.

The need for fuel economy data vehicles arises from the fact that not all base levels are represented by emission certification tests. For purposes of determining compliance with emission certification standards, manufacturers' product lines are divided into engine families. Relatively few test vehicles (usually three to five) are tested from each engine family. These emission data vehicles are selected on the basis that the configuration is either projected to be a high seller or one that would be expected to exhibit high emissions. The expected high emission vehicle is selected on the premise that if the worst car in the engine family can meet the standards, the rest will likely meet the standards. Hence, a significant fraction of the vehicle configurations covered by a certificate of conformity may not have been tested for emissions or fuel economy.

Fuel economy data vehicles can have one or two origins: prototypes, such as used for emission certification, or production vehicles. Production vehicles, including those that might be a part of a manufacturer's emission audit program or a Selective Enforcement Audit (SEA) test order, must be qualified by such procedures as checking the calibration of key components to assure that the vehicles are capable of generating representative fuel economy values.

One manufacturer commented that SEA vehicles and production vehicles are not appropriate to use as fuel economy data vehicles. SEA vehicles are tested at low mileage, which this manufacturer considers unacceptable. Production vehicles would be unavailable at the beginning of the year to serve as fuel economy data vehicles, and are typically produced at some location far removed from the testing site. However, although this particular manufacturer may not wish to use SEA vehicles, it is still appropriate to leave these provisions in the regulations. The Agency is of the opinion that data generated by SEA vehicles and production vehicles can provide valid fuel economy data (assuming that they meet the requirements of Subpart A of Part 600), and allowing their use gives added flexibility to the manufacturers. The use of SEA vehicles is not required by the regulations, but remains optional with manufacturers.

In addition to these options, to ease the burden of submitting additional data, manufacturers are permitted to change componnets on previously tested vehicles to represent other vehicle configurations. Fuel economy data vehicles may also be tested at different inertia weight and road load power settings in order to represent more than one vehicle configuration.

Fuel economy data vehicles are permitted to have accumulated up to 10,000 miles. Although the 1976 voluntary fuel economy program specified some minimum mileage (2,000 miles for non-catalyst vehicles and 4,000 miles for catalyst vehicles), these final regulations eliminated the minimum. It is generally accepted that the fuel economy of a vehicle improves with the first few thousand miles as friction decreases. However, some automobile engines may be manufactured in such a way that the initial break-in period is minimized by operating the engine on a dynamometer or some other technique. By the time the vehicle completes the production process, the fuel economy characteristics of the vehicle may be essentially representative of a stabilized automobile. Therefore, the Agency has concluded that the question of the minimum mileage at which a test vehicle is capable of producing representative fuel economy data is best left to the manufacturer, since it would be to the manufacturer's disadvantage to test a vehicle prior to the time it is stabilized from a fuel economy standpoint.

As an additional criterion, all fuel economy data vehicles must meet applicable emission standards in order to be accepted for fuel economy purposes. If a vehicle fails to meet standards, no penalty is imposed under the fuel economy program other than rejecting the vehicle for the purposes of fuel economy testing. By permitting this increased flexibility

in selecting and testing fuel economy data vehicles, manufacturers are encouraged to submit additional vehicles, thus improving the accuracy of the booklet and label values and encouraging participation in specific labeling. However, if individual configurations or groups of fuel economy data vehicles experience difficulty in meeting emission standards during fuel economy testing, the Administrator may carry out appropriate investigations under the provisions of the Clean Air Act to identify the specific emission-related problem(s), the extent of the problem(s), and the corrective action.

Two manufacturers commented that they felt that jeopardy under the Clean Air Act based upon the testing of fuel economy data vehicles was unjustified. However, the Agency cannot ignore overt indications of emission non-compliance. Since the manufacturer suffers no direct penalty other than being asked to supply more data (fuel economy data vehicles exceeding emission standards may trigger an investigation, but do not automatically trigger any adverse action), EPA has concluded that a manufacturer that is actually in compliance with the Clean Air Act will suffer no inappropriate jeopardy.

The final regulations also include the proposed provision by which a manufacturer can use analytical techniques to develop additional fuel economy data in lieu of testing actual vehicles. The techniques must be approved by EPA prior to use for generating data for fuel economy labeling. It is expected that the approval of analytical methods would be limited to those addressing parameters with readily quantifiable effects on fuel economy such as axle ratio, inertia weight, and road load power setting.

All comments on this aspect of the NPRM were in favor of the provision. Although a number of issues relating to details of the administration of the provisions were raised, the Agency has concluded that it is inappropriate to include such details as part of these regulations. These details relate to the individual manufacturer's techniques used to predict fuel economy, and each manufacturer's proposal will be evaluated individually when it is submitted.

V. *Additional comments.* A number of manufacturers supplied comments and information which were not specifically solicited by the NPRM.

Comparability of test procedures. One manufacturer was concerned that nowhere in the regulatory package did EPA address the comparability of test procedures to those used in the 1975 model year (a requirement of section 503 of the Act). In particular, this manufacturer pointed out a discrepancy in the carbon balance equation used to calculate fuel economy from exhaust emission test results as published in the NPRM from equations published earlier. Although the Act only requires comparability of test procedures for data used in the calculation of a manufacturer's average fuel economy (not a part of this rule making), EPA fully intends that the labeling program use test procedures comparable to those used in the 1975 model year. Directly addressing the comment, EPA has determined that the version of the carbon balance equation published prior to the NPRM was incorrect and was not the equation actually used by EPA in the 1975 model year. The equation published in the NPRM does correctly represent the 1975 model year procedure, is identical to the 1975 procedure, and is therefore "comparable".

Vehicle configuration definition. Several manufacturers commented on the proposed definition of vehicle configuration. The NPRM defined vehicle configuration, engine code and transmission configuration. Most of the respondents were concerned that the vehicle configuration definition was expanded from the definition used in the 1976 labeling program. EPA intends that these published definitions would actually operate in the same manner as the earlier definitions from voluntary fuel economy programs. Although the prerogative of the Administrator to define transmission configuration is expanded in the definition in the NPRM, in almost all cases, these (transmission) parameters are uniform within a 1976 vehicle configuration, or involve differences of insignificant magnitude, thus very few new configurations would be created by potential subdivision of 1976 configurations according to the new definitions.

Two manufacturers commented that axle ratio should be replaced by N/V[1] in the vehicle configuration definition. N/V was not included as a vehicle configuration parameter because of the excessive number of vehicles required to evaluate the effect of N/V. The often minor differences in fuel economy that this change would monitor do not warrant the additional expense that the testing would entail.

EPA defined vehicle configuration parameters by isolating those characteristics which most predominantly affect fuel economy. Based on data from past model years, the parameters which were most promising from a cost effectiveness/fuel consumption sensitivity standpoint were included in the definition. EPA could not agree with one commentator's contention that engine code and calibration items, as well as the various transmission variables, do not cause detectable changes in fuel consumption. Data from past years' fuel economy testing supports the Agency's position.

The vehicle configuration, engine code, and transmission configuration definitions from the NPRM are being retained in this final rule making.

EPA processing time. The proposed regulations notified manufacturers that they should submit requests for label calculations and approval twenty-five days before the manufacturer wishes to use these labels. Some manufacturers commented that, based upon past experience under the voluntary fuel economy labeling programs, twenty-five working days time allowance for the Administrator to approve label fuel economy values is excessive and should be revised downward to a maximum of 15 working days.

Furthermore, some manufacturers commented that the regulations should also include a minimum time span within which the Administrator initiates action on a labeling request. The purpose of the regulations is to instruct the regulated industry as to the procedures it must follow, not to constrain the Administrator to maximum response time. However, the proposed labeling regulations implied that a working 25-day period would provide sufficient lead-time to assure the Administrator's approval of label values. As in past voluntary programs, it is expected that the Administrator will respond and approve label values on the average in much less than 25 working days. The proposed regulation provision is only intended to provide guidance to the manufacturer, indicating a reasonable maximum time period which he should incorporate in his plans if the timing of receipt of an approved label value is crucial. The probable maximum time considered is still accurate.

Label maintenance. The Motor Vehicle Manufacturer's Association commented that dealers should be permitted to remove labels from automobiles being used for test, demonstration, or similar purposes provided that a proper label is affixed to the automobile before it is offered for sale.

The Act requires that a manufacturer cause to be affixed and a dealer cause to be maintained a fuel economy label. Nowhere in the Act is there provided any exemption to this requirement. The Automobile Information Disclosure Act makes the same requirements for the price label. In addition, common logic dictates that the intended effect of the fuel economy label is most likely to be realized on demonstration vehicles, which are intended to influence buyer decisions. If a dealer removes a label, and the car is sold without a label the manufacturer could be prosecuted for failure to attach the label, or the dealer could be prosecuted for a failure to maintain it.

Label location. Several manufacturers commented that the requirements for label location on the vehicle are too restrictive, are unnecessarily burdensome and will result in disruption of the manufacturing process. The Automotive Information Disclosure Act allows the price ("Monroney") label to be affixed to the "windshield, or any side window". Since the fuel economy may be combined with the Monroney Label, it seems reasonable to use the same guidelines for label location. Thus, these regulations permit the fuel economy label to be affixed to the windshield, or any side window, but it must be located as close to the Monroney label as possible if not incorporated in the Monroney label itself.

[1] N/V ratio is defined as the quotient of engine speed in RPM divided by vehicle speed in MPH measured in the lowest numerical ratio, i.e., highest transmission gear.

Updating of labels. The proposed regulations prohibited a manufacturer from changing the fuel economy values of an approved specific label. One manufacturer requested that these regulations be amended to allow a manufacturer to, at his option, add more test data so as to change the specific label fuel economy value. Prior to label approval, a manufacturer may submit all of the information (including test data) he feels is necessary in order to calculate a representative fuel economy estimate. However, EPA has determined that labeling vehicles which are otherwise identical with different fuel economy values would result in consumer confusion. Therefore, after EPA has approved fuel economy label values, these values may not be changed throughout the rest of the model year.

Definitions. Manufacturer's comments pointed out that since the Preamble and the Notice refer to "introduction date", this term should be explicitly defined in the regulations. EPA has dropped the term "Public Introduction Date" and is using the range requirement date in lieu of the public introduction date.

Inspections. Several comments expressed concern with that portion of the proposed regulations providing for unannounced inspections by authorized EPA Enforcement Officers and suggested that these inspections were violative of the Fourth Amendment to the U.S. Constitution. It was suggested that EPA Enforcement Officers be admitted to a manufacturer's facilities only after reasonable prior written notice and/or a judicial warrant. (It should be noted that the rules provide that unannounced entries may be made only after authorization by the Assistant Administrator for Enforcement.)

Because of the inevitable conflict of interest which results from any compliance system where a significant part of the regulatory activity is controlled by those being regulated, it is essential that EPA personnel have access to manufacturer's facilities in order to determine whether the requirements of the regulations are being faithfully followed. Specifically, the inspection and monitoring activities shall be for the purpose of gathering information to enable the Administrator to satisfy himself that required records are being kept, that products which will be tested are being selected and properly prepared for testing, that tests are being properly conducted and that the testing instruments are accurate. Such inspection and monitoring activities will include access to all facets of the testing program required by the regulations; records, and test results which must be maintained; and facilities (production, test and storage) which are connected with the fuel economy testing and labeling of a manufacturer's automobiles.

At a minimum, 24 hours prior notice will normally be given to a manufacturer by the Director of the Mobile Source Enforcement Division or his representative advising him of any visit of EPA Enforcement Officers. However, the regulation does provide for notice only at the time of the visit provided the visit is specifically authorized in writing by the Assistant Administrator for Enforcement.

Such unannounced entries by properly authorized and certified EPA Enforcement Officers are reasonable and are in compliance with the U.S. Constitution. *Colonade Catering Corp.* v. *United States*, 397 U.S. 30 (1970); *United States* v. *Biswell*, 406 U.S. 311 (1972); *Wyman* v. *James*, 400 U.S. 309 (1971). Such entries are limited to reasonable hours and specified facilities of the manufacturer which are relevant to fuel economy testing. Moreover, because of the critical nature of the Agency's information gathering purpose under the Act, provision for such entry is necessary to insure the accuracy of the fuel economy figures and the compliance by the manufacturer with the fuel economy procedures.

Most importantly, section 505(c) of the Act (15 U.S.C. § 2005(c)) clearly grants authority to make such inspections: "Such manufacturer shall, upon request of a duly designated agent of the Secretary (of DOT) or the EPA Administrator who presents appropriate credentials, permit such agent, at reasonable times and in a reasonable manner, to enter the premises of such manufacturer to inspect automobiles and appropriate books, papers, records, and documents."

Additionally, some manufacturers commented that the Act does not allow EPA to require that manufacturers admit an EPA Enforcement Officer to a facility that the manufacturer neither owns nor controls. This provision is designed for those manufacturers who may contract with an independent testing facility for their fuel economy testing. Such testing by independent laboratories is permissible under the regulations. It is not consistent with the purpose of the Act to allow a manufacturer to circumvent the inspection provisions by contracting the fuel economy testing to independent test facilities. An independent testing facility contracted for by the manufacturer is as much a manufacturer's testing facility for the purposes of this Act as one owned by a manufacturer. A manufacturer who so contracts with an independent laboratory without assurance that the manufacturer's vehicles will be subject to the same inspection as in a manufacturer's own facilities will risk having the test results not accepted by the Administrator.

EPA has deleted the provision under which EPA Enforcement Officers may, during the course of an inspection, require the manufacturer to conduct additional fuel economy testing. However, since the purpose of an inspection is to uncover any potential discrepancies in fuel economy test data submitted by the manufacturer, the right to require additional testing has been retained. If an inspection indicates that manufacturer fuel economy test data may be unreasonable or unrepresentative due to failure of the manufacturer to follow proper testing procedures or use good engineering practice, or improperly calibrated or faulty test equipment, EPA will notify the manufacturer in writing that additional testing is required and either request that the manufacturers conduct the tests or submit vehicles for testing. The fact that fuel economy data has already been accepted by the Administrator shall not limit the Administrator's right to require additional testing. The provision has been added to provide that the Administrator may reject data on the basis of the finding of an inspection and to recalculate a manufacturer's average. A manufacturer would be given the right to a hearing in such an event pursuant to § 600.009.

Assistance to enforcement officers. Comments were received protesting the requirements of § 600.005(b)(5)(iv), the definition of reasonable assistance. The NPRM required clerical services, making personnel available to provide information to the Enforcement Officer, the limitations of an employee's selection of counsel, and the authority of an Enforcement Officer to order additional testing. In response to the comments, these provisions have been reduced in scope in the final rules.

Record keeping. One manufacturer commented that requirements for recordkeeping of fuel economy data vehicles were excessive and unnecessary. They confended that they should be required only to document that the vehicle was built to released specifications and that use prior to fuel economy testing was not unusual or extreme.

The Act gives the Administrator very broad power to require that records be made and maintained. Since much of the testing and mileage accumulated conducted under these regulations will not be witnessed by the Administrator or his agent, it is imperative that complete records be kept in order to verify that all procedures employed were in concert with the regulations. The Agency believes that it is imperative that its ability to monitor and maintain the integrity of the program be maintained, and complete and accurate record keeping procedures are essential to this end.

VI. Revision of regulations for 1978 and later model years. Although these regulations are final for 1977 and will continue in effect for subsequent model years unless superseded, EPA recognizes the need to continually consider appropriate improvements to the program. Certain issues have already been identified as appropriate for reconsideration and possible revision for 1978 and later model years. Among the regulatory provisions that have been so identified are the following:

(1) The method of classification of comparable automobiles including the way interior volume is measured, the selection of borders (cut points) between classes of cars and the possible use of additional objective criteria for the classification of car lines which fall on or near the cut points;

(2) The number, types and requirements for use of labels, i.e., should there continue to be two types of labels (general and specific) or should the grouping of vehicles currently included in the general label be revised to be narrower, though less narrow

than that currently used for the specific label, so that only one type of label would be used?

Although any revisions will be subject to formal proposal in the FEDERAL REGISTER and a formal comment period prior to promulgation, EPA would appreciate the comments of interested parties as to appropriate revisions to these regulations for the 1978 model year and those following by January 10, 1976 so that rule making could take place in time for the 1978 model year. Such views may be sent in writing to Deputy Assistant Administrator for Mobile Source Air Pollution Control, (AW-455) U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

VII. Title and statutory authority. This notice of final rule making is issued under the authority of Title V of Motor Vehicle Information and Cost Savings Act, 15 U.S.C. 1901 et seq. as added by Title III of the Energy Policy and Conservation Act, Pub. L. 94-163, 89 Stat. 901.

Effective date: Since the 1977 model year is several months old and the industry has generally followed the practices contained in these regulations, the Administrator finds good cause to require that these regulations become effective on November 10, 1976.

Dated: November 2, 1976.

RUSSELL E. TRAIN,
Administrator.

Part 600 of Chapter 1, Title 40 of the Code of Federal Regulations is amended in Subparts A and C as follows:

Subpart A—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—General Provisions

1. § 600.002-77 is amended by revising definition (a)(8) and adding definitions (33) through (37) to read as follows:

§ 600.002-77 Definitions.

(a) * * *

(8) "Federal Highway Fuel Economy Test Procedure" refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in Subpart G of this part which are used to derive highway fuel economy data.

* * * * * *

(33) "Body Style" means a level of commonality in vehicle configurations as defined by number of doors and roof treatment (e.g., sedan, convertible, fastback, hatchback) and number of seats (i.e. front seat, second, or third seat) requiring seat belts pursuant to National Highway Traffic Safety Administration safety regulations. Station wagons and light trucks are identified as car lines.

(34) "Hatchback" means a passenger automobile where the conventional luggage compartment, i.e., trunk, is replaced by a cargo area which is open to the passenger compartment and accessed vertically by a rear door which encompasses the rear window.

(35) "Pickup Truck" means a nonpassenger automobile which has a passenger compartment and an open cargo bed.

(36) "Station Wagon" means a passenger automobile with an extended roof line to increase cargo or passenger capacity, cargo compartment open to the passenger compartment, a tailgate and one or more rear seats readily removed or folded to facilitate cargo carrying.

(37) "Gross Vehicle Weight Rating" means the manufacturer's gross weight rating for the individual vehicle.

(38) "Ultimate Consumer" means the first person who purchases an automobile for purposes other than resale, or leases an automobile.

2. A new section, § 600.002-78, is added and reads as follows:

§ 600.002-78 Definitions.

The following definition applies beginning with the 1978 model year. § 600.002-77 applies except § 600.002-77(8) which is hereby superseded.

(8) "Federal Highway Fuel Economy Test Procedure" refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in Subpart B of this part and which are used to derive highway fuel economy data.

§ 600.003-77 [Amended]

3. 600.003-77 is amended by adding the following abbreviation: GVWR—Gross Vehicle Weight Rating.

4. A new section, § 600.005-77, is added and reads as follows:

§ 600.005-77 Maintenance of records and right of entry.

The provisions of this section are applicable to all fuel economy data vehicles. Certification vehicles are required to meet the provisions of § 86.007-7.

(a) The manufacturer of any new motor vehicle subject to any of the standards or procedures prescribed in this part shall establish, maintain, and retain the following adequately organized and indexed records.

(1) General records.

(i) Identification and description of all vehicles for which data are submitted to meet the reuirements of this part.

(ii) A description of all procedures used to test each vehicle.

(iii) A copy of the information required to be submitted under § 600.006 fulfills the requirements of paragraph (a)(1)(i).

(2) Individual records.

(i) A brief history of each vehicle for which data are submitted to meet the requirements of this part, in the form of a separate booklet or other document for each separate vehicle, in which must be recorded:

(A) The steps taken to ensure that the vehicle with respect to its engine, drive train, fuel system, emission control system components, exhaust after treatment device, vehicle weight, or any other device or component, as applicable, will be representative of production vehicles.

(B) A complete record of all emission tests performed under Part 86 and all fuel economy tests performed under Part 600 (except tests actually performed by EPA personnel), including all individual worksheets and other documentation relating to each such test, or exact copies thereof, the date, time, purpose, and location of each test, the number of miles accumulated on the vehicle when the tests began and ended, and the names of supervisory personnel responsible for the conduct of the tests.

(C) A description of mileage accumulated since selection or build-up of such vehicles including the date and times of each mileage accumulation listing both the mileage accumulated and the name of each driver, or each operator of the automatic mileage accumulation device, if applicable. Additionally, a description of mileage accumulated prior to selection or build-up of such vehicle must be maintained in such detail as is available.

(D) If used, the record of any devices employed to record the speed or mileage, or both, of the test vehicle in relationship to time.

(E) A record and description of all maintenance and other servicing performed, within 2,000 miles prior to fuel economy testing under this part, giving the date and time of the maintenance or service, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the maintenance or service. A copy of the maintenance information to be submitted under § 600.006-77 fulfills the requirements of paragraph (a)(2)(i)(E).

(F) A brief description of any significant events affecting the vehicle during any time in the period covered by the history not described in an entry under one of the previous headings including such extraordinary events as vehicle accidents or driver speeding citations or warnings.

(3) The manufacturer shall retain all records required under this subpart for a period of five years after the end of the model year to which they relate. Records may be retained as hard copy or reduced to microfilm, punch cards, etc., depending on the record retention procedures of the manufacture, provided that in every case all the information contained in hard copy shall be retained.

(b)(1) Any manufacturer who has supplied fuel economy data to meet the requirements of this part shall admit any EPA Enforcement Officer during operating hours upon presentation of credentials at any of the following:

(i) Any facility where any fuel economy tests from which data are submitted or any procedures or activities connected with these tests are performed.

(ii) Any facility where any new motor vehicle which is being, was, or is to be tested is present.

(iii) Any facility where any construction process used in the modification or build-up of a vehicle into a fuel economy data vehicle is taking place or has taken place.

(iv) Any facility where any record or other document relating to any of the above is located.

(2) Upon admission to any facility referred to in paragraph (b)(1) of this section, the manufacturer shall allow any EPA Enforcement Officer:

(i) To inspect and monitor any part or aspect of procedures activities, and test-

ing facilities, including, but not limited to, monitoring vehicle preconditioning, emission tests and fuel economy tests and mileage accumulation, maintenance, and vehicle soak and storage procedures; and to verify correlation of calibration of test equipment;

(ii) To inspect and make copies of any required records, designs, or other documents; and

(iii) To inspect and photograph any part or aspect of any fuel economy vehicle and any components to be used in the construction thereof.

(3) Any EPA Enforcement Officer will be furnished, by those in charge of a facility being inspected, with such reasonable assistance as may be required to help discharge any function listed in this paragraph (b). Each manufacturer is required to have those in charge of the facility furnish such reasonable assistance without charge to EPA whether or not the manufacturer controls the facility.

(4) The duty to admit any EPA Enforcement Officer shall be applicable whether or not the manufacturer owns or controls the facility in question and is applicable to both domestic and foreign manufacturers and facilities. An EPA Enforcement Officer will not attempt to make any inspections which the officer has been informed are in contravention of any law. However, if local law makes it impossible for the EPA Enforcement Officer to verify or to insure the accuracy of data generated at a facility such that no informed judgment can properly be made as to the accuracy or reliability of data generated by or obtained from the facility, then a vehicle or data from that vehicle shall not be accepted for use in Subparts C or F of this part (unless the Administrator is otherwise convinced of the accuracy and reliability of such data).

(5) For purposes of this paragraph (b):

(i) "Presentation of credentials" means display of the document designating a person as an EPA Enforcement Officer.

(ii) Where vehicle, component, or engine storage areas or facilities are concerned, "operating hours" shall mean all times during which personnel other than custodial personnel are at work in the vicinity of the area or facility and have access to it.

(iii) For facilities or areas other than those covered by paragraph (b)(5)(ii) the term, "operating hours" will mean all times during which an assembly line is in operation or all times during which testing, maintenance, mileage accumulation, production or compilation of records, or any other procedure or activity related to fuel economy testing, or to vehicle manufacture or assembly is being carried out in a facility.

(iv) "Reasonable assistance" means providing timely and unobstructed access to and opportunity for the copying of any record, book, paper, or document required to be maintained under this section and providing timely and unobstructed access to any motor vehicle, testing facility, or testing equipment.

(v) Any entry without 24 hours prior written or oral notification to the affected manufacturer shall be authorized in writing by the Assistant Administrator for Enforcement.

5. § 600.007–77 is amended by adding paragraph (e) to read as follows:

§ 600.007–77 Vehicle acceptability.

* * * * *

(e) If, based on a review of the emission data for a fuel economy data vehicle, submitted under § 600.006(b), or emission data generated by a vehicle tested under § 600.008(e), the Administrator finds an indication of non-compliance with Section 202 of the Clean Air Act, 42 U.S.C. Section 1857 et seq. of the regulation thereunder, he may take such investigative actions as are appropriate to determine to what extent emission noncompliance actually exists.

(1) The Administrator may, under the provisions of § 86.077–37(a) request the manufacturer to submit production vehicles of the configuration(s) specified by the Administrator for testing to determine to what extent emission noncompliance of a production vehicle configuration or of a group of production vehicle configurations may actually exist.

(2) If the Administrator determines, as a result of his investigation, that substantial emission non-compliance is exhibited by a production vehicle configuration or group of production vehicle configurations, he may proceed with respect to the vehicle configuration(s) as provided under section 206(b)(2) or section 207(c)(1), as applicable, of the Clean Air Act, 42 U.S.C. section 1857 et seq.

6. § 600.008–77 is amended by adding paragraph (h) to read as follows:

§ 600.008–77 Review of fuel economy data testing by the Administrator.

* * * * *

(h)(1) If, based on the results of an inspection conducted under § 600.005(b) or any other information, the Administrator has reason to believe that the manufacturer has not followed proper testing procedures or that the testing equipment is faulty or improperly calibrated, or if records do not exist that will enable him to make a finding of proper testing, the Administrator may notify the manufacturer in writing of his finding and require the manufacturer to:

(i) Submit the test vehicle(s) upon which the data are based or additional test vehicle(s) at a place he may designate for the purpose of fuel economy testing.

(ii) Conduct such additional fuel economy testing as may be required to demonstrate that prior fuel economy test data are reasonable and representative.

(2) Previous acceptance by the Administrator of any fuel economy test data submitted by the manufacturer shall not limit the Administrator's right to require additional testing under paragraph (h)(1).

(3) If, based on tests required under subparagraph (1), the Administrator determines that any fuel economy data submitted by the manufacturer and used to calculate the manufacturer's fuel economy average was unrepresentative, the Administrator may recalculate the manufacturer's fuel economy average based on fuel economy data that he deems representative.

(4) A manufacturer may request a hearing as provided in § 600.009 if the Administrator decides to recalculate the manufacturer's average pursuant to determinations made relative to this section.

7. A new section, § 600.010–77 is added and reads as follows:

§ 600.010–77 Vehicle test requirements.

(a) For each certification vehicle, as defined in this part:

(1) The manufacturer shall generate city fuel economy data by testing according to the applicable procedures.

(2) The manufacturer shall generate highway fuel economy data by:

(i) Testing according to applicable procedures, or

(ii) Use of an analytical technique as described in § 600.006(e)

(3) The data generated in (1) and (2) shall be submitted to the Administrator in combination with other data for the vehicle required to be submitted in Part 86.

(b) For each fuel economy data vehicle:

(1) The manufacturer shall generate city fuel economy data and highway fuel economy data by:

(i) Testing according to applicable procedures, or

(ii) Use of an analytical technique as described in § 600.006(e), in addition to testing (e.g., city fuel economy data by testing, highway fuel economy data by analytical technique).

(2) The data generated shall be submitted to the Administrator according to the procedures in § 600.006.

Subpart C—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—Procedures for Calculating Fuel Economy Values

1. § 600.206–77 is amended by adding paragraphs (b) and (c) to read as follows:

§ 600.206–77 Calculation and use of fuel economy values for a vehicle configuration.

* * * * *

(b) The city, highway, and combined fuel economy values determined for the vehicle configuration according to paragraph (a) and rounded to the nearest whole mile per gallon comprise the fuel economy values that appear on specific labels as described in § 600.309.

(c) The annual fuel cost estimate for operating an automobile included in a vehicle configuration will be computed by the Administrator by using values for the fuel cost per gallon and average annual mileage and the combined fuel economy determined in (a)(3).

(1) The annual fuel cost estimate for a vehicle configuration is computed by multiplying

(i) Fuel cost per gallon (as obtained by the Administrator from the FEA Administrator), expressed in dollars to the nearest 0.01 dollar, by

(ii) Average annual mileage (as obtained by the Administrator from the Secretary), expressed in miles per year to the nearest mile per year, by

(iii) The inverse of the combined fuel economy value for a vehicle configuration, expressed in miles per gallon to the nearest 0.0001 mile per gallon.

(2) The product computed in (c)(1) and rounded to the nearest dollar per year will comprise the annual fuel cost estimate that appears on specific labels for that vehicle configuration.

2. § 600.207–77 is amended by adding paragraphs (a)(5), (c) and (d) to read as follows:

§ 600.207–77 Calculation and use of fuel economy values for a model type.

(a) * * *

(5) For the purposes of calculating a base level fuel economy value, if the only vehicle configuration(s) within the base level are vehicle configuration(s) which are intended for sale at high altitude, the Administrator may use fuel economy data from tests conducted on these vehicle configuration(s) at high altitude to calculate the fuel economy for the base level.

* * * * *

(c) The city, highway, and combined fuel economy values as calculated in § 600.207(b) and rounded to the nearest whole mile per gallon are the fuel economy values used on general labels for that model type.

(d) The annual fuel cost estimate for operating an automobile included in a model type will be computed by the Administrator by using values for the fuel cost per gallon and average annual mileage, predetermined by the Administrator, and the combined fuel economy determined in (b).

(1) The annual fuel cost estimate for a model type is computed by multiplying

(i) Fuel cost per gallon expressed in dollars to the nearest 0.01 dollar, by

(ii) Average annual mileage, expressed in miles per year to the nearest mile per year, by

(iii) The inverse of the combined fuel economy value for model type, expressed in miles per gallon to the nearest 0.0001 mile per gallon.

(2) The product computed in (d)(1) and rounded to the nearest dollar per year will comprise the annual fuel cost estimate that appears on general labels for that model type.

3. A new section, § 600.208–77, is added and reads as follows:

§ 600.208–77 Sample calculation.

An example of the calculation required in this subpart appears in Appendix III.

Subparts D, E, and G of 40 CFR Part 600 are added as follows:

Subpart D—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—Labeling

Sec.

600.301–77 General applicability.
600.302–77 Definitions.
600.303–77 Abbreviations.
600.304–77 Section numbering, construction.
600.305–77 Record keeping.
600.306–77 Labeling requirements.
600.307–77 Format of labels.
600.308–77 General label contents.
600.309–77 Specific label contents.
600.310–77 Labeling of high altitude vehicles.
600.311–77 Range of fuel economy for comparable automobiles.
600.312–77 Approval of labels.
600.313–77 Timetable for data and information submittal and review.
600.314–77 Updating fuel economy, annual fuel cost, and range of fuel economy for comparable automobiles.
600.315–77 Classes of comparable vehicles.

Appendix IV—Sample fuel economy label formats.

Subpart E—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—Dealer Availability of Fuel Economy Information

600.401–77 General applicability.
600.402–77 Definitions.
600.403–77 Abbreviations.
600.404–77 Section numbering, construction.
600.405–77 Dealer requirements.
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Subpart D—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—Labeling

§ 600.301–77 General applicability.

The provisions of this subpart are applicable to 1977 and later model year automobiles.

§ 600.302–77 Definitions.

The definitions in § 600.002 apply to this subpart.

§ 600.303–77 Abbreviations.

The abbreviations in § 600.003 apply to this subpart.

§ 600.304–77 Section numbering, construction.

The section numbering procedure set forth in § 600.004 applies to this subpart.

§ 600.305–77 Record keeping.

The record keeping requirements set forth in § 600.005 apply to this subpart.

§ 600.306–77 Labeling requirements.

(a) Prior to being offered for sale, each manufacturer shall affix or cause to be affixed and each dealer shall maintain or cause to be maintained on each automobile a general or specific fuel economy label, approved by the Administrator, that includes fuel economy information, and annual fuel cost estimate.

(1) Each manufacturer shall affix or cause to be affixed a general label as described in § 600.308, or

(2) At option of the manufacturer, the requirements of this paragraph may be satisfied by labeling an automobile with a specific label, as described in § 600.309 in place of the general label.

(i) If the manufacturer elects to use a specific label within a model type (as defined in § 600.002(a)(19)), he shall also have approved specific labels affixed on all automobiles within this model type, except on those automobiles manufactured or imported before the date that labels are required to bear range values as required by paragraph (b) or determined by the Administrator or as permitted under § 600.310.

(ii) If a manufacturer elects to change from general to specific labels or vice versa within a model type, the manufacturer shall, within five calendar days, initiate or discontinue as applicable, the use of specific labels on all vehicles within a model type at all facilities where labels are affixed.

(b) The manufacturer shall include the current range of fuel economy of comparable automobiles (as described in § 600.314) in the label of each vehicle manufactured more than fifteen calendar days after the current range is made available by the Administrator.

(1) Automobiles manufactured before sixteen calendar days after the initial label range is made available under § 600.314(d)(1) will be labeled without a range of fuel economy of comparable automobiles. In place of the range of fuel economy of comparable automobiles, the label will contain a statement indicating that, as of the date of production or importation of this automobile, no range of fuel economy of comparable automobiles was available.

(2) Automobiles manufactured more than fifteen calendar days after the initial or updated label range is made available under § 600.314(d)(1) or (2) will be labeled with the current range of fuel economy of comparable automobiles as approved for that general or specific label.

(c) The fuel economy label must be readily visible from the exterior of the automobile and remain affixed until the time the automobile is delivered to the actual custody and possession of the ultimate consumer.

(1) The fuel economy label must be located on the windshield, or on a side window. If the window is not large enough to contain both the Automobile Information Disclosure Act label and the fuel economy label, the manufacturer shall have the fuel economy label affixed on another window and as close as possible to the Automobile Information Disclosure Act label.

(2) The fuel economy label information may be included with the Automobile Information Disclosure Act label if the prominence and legibility of the fuel economy label is maintained. For this purpose, all fuel economy label information must be placed on a separate sec-

tion of the label and may not be intermixed with the Automobile Information Act label information.

(3) The manufacturer shall have the fuel economy label affixed in a manner so that appearance and legibility are maintained until after the vehicle is delivered to the ultimate consumer.

§ 600.307–77 Format of labels.

The fuel economy label must:

(a) Be rectangular in shape and large enough to allow inclusion of all required information:

(b) Be printed in a color which contrasts with the paper color and in a type size that is easily readable;

(c) Contain a reproduction of both the EPA and the FEA logos;

(d) Contain a statement that the vehicle fuel economy estimates included are based on the results of tests conducted or certified by the U.S. Environmental Protection Agency;

(e) Describe the labeled vehicle in the manner and degree of detail specified in § 600.308 or § 600.309, as applicable.

(f) Contain that vehicle's fuel economy estimates as calculated in § 600.206 or § 600.207, as applicable, and as approved by the Administrator, to represent a city fuel economy, a highway fuel economy, and a combined fuel economy value;

(g) Contain a range of fuel economy estimates and class identification for similar vehicles whether or not manufactured by that vehicle's manufacturer except as provided in § 600.306. This range is determined according to § 600.311 and supplied to the manufacturer by the Administrator;

(h) Contain the estimated annual fuel cost for the operation of that vehicle based on calculations described in § 600.206 or § 600.207, as applicable;

(i) State that these fuel economy estimates and the estimated annual fuel cost are based on tests of vehicles equipped with frequently purchased optional equipment;

(j) State that the actual fuel economy of this vehicle will vary depending on the type of driving the customer does, the customer's driving habits, vehicle maintenance, optional equipment installed and used, and road and weather conditions; and

(k) State that for the purposes of comparing fuel economies of vehicles of that model year and to learn how the tests were conducted, the booklet described in Subpart E for that model year is available free upon request from the dealer.

Sample fuel economy label formats and language that would be approved are included in Appendix IV. Some exceptions to the above requirements may be made on an individual basis by the Administrator for the 1977 model year.

§ 600.308–77 General label contents.

The general fuel economy label must contain the following:

(a) The information and statements as described in § 600.307 (a) through (k).

(b) A description of the applicable vehicle specifying:

(1) Vehicle car line,

(2) Number of engine cylinders,

(3) Engine displacement, in cubic inches, cubic centimenters, or liters, whichever is consistent with the customary description of that engine,

(4) Fuel metering system, including number of carburetor barrels, if applicable,

(5) Transmission class,

(6) Catalyst usage, if so equipped,

(7) Other engine or vehicle parameters, if approved by the Administrator, and

(8) California emission control system usage, where applicable, if the Administrator determines that automobiles intended for sale in the State of California are likey to exhibit significant differences in fuel economy from those intended for sale in other states.

(c) General label fuel economy values and estimated fuel cost as calculated according to § 600.207.

(d) The estimated range of fuel economy of comparable automobiles and effective date, except as provided in § 600.306. This range is determined by the Administrator according to § 600.311 for each class of vehicles as described in § 600.315.

§ 600.309–77 Specific label contents.

The specific fuel economy label must contain the following:

(a) The information and statements as described in § 600.307 (a) through (k);

(b) A statement that the fuel economy estimates are from tests of this specific vehicle configuration and might not be in the booklet described in Subpart E.

(c) A description of the applicable vehicle specifying:

(1) Car line,

(2) Engine displacement,

(3) Number of cylinders,

(4) Transmission class and number of forward speeds,

(5) Fuel metering system, including number of carburetor barrels, if applicable,

(6) Catalyst usage, if so equipped,

(7) Other engine or vehicle parameters, if approved by the Administrator,

(8) Test (inertia) weight,

(9) Axle ratio, and

(10) California emission control system usage, where applicable, if the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy from those intended for sale in other States.

(d) Specific label fuel economy values and estimated fuel cost for that vehicle as determined according to § 600.206.

(e) The estimated range of fuel economy of comparable automobiles and effective date of the range except as provided in § 600.306(b)(1). This range is determined by the Administrator according to § 600.311 for each class of vehicles as described in § 600.315.

§ 600.310–77 Labeling of high altitude vehicles.

(a) The Administrator may approve, at the request of the manufacturer, specific labels for high altitude vehicles according to § 600.309.

(b) A high altitude vehicle may be labeled with an approved general or specific label by a manufacturer without regard to type of label, general or specific, used at low altitude for that model type or vehicle configuration.

§ 600.311–77 Range of fuel economy for comparable automobiles.

(a) The Administrator will determine the range of fuel economy values for each class of comparable automobiles.

(1) The range of fuel economy values within a class is computed from the maximum combined fuel economy value and minimum combined fuel economy value for all general label combined fuel economy values within the class, as determined in § 600.207(b) regardless of manufacturer.

(2) If the Administrator determines that automobiles intended for sale in California are likely to exhibit significant differences in fuel economy from those intended for sale in other states, he will compute separate ranges of fuel economy values for each class of automobiles for California and for the other states.

(3) For high altitude vehicles determined under § 600.310, both general and specific labels will contain the range of comparable fuel economy computed in this paragraph.

(4) The range of comparable fuel economy values for a class of automobiles is derived from the latest available data approved by the Administrator for that class of automobiles.

(b) The manufacturer shall include the range of fuel economy determined by the Administrator in (a) on each label affixed to an automobile within that class except as provided in § 600.306.

§ 600.312–77 Approval of labels.

All fuel economy values, fuel cost estimates, label formats, and other information pertaining to the fuel economy label must be approved by the Administrator before a label is affixed to the vehicle.

(a) If the manufacturer intends to use specific labels, both a specific label format and a general format must be approved prior to use of the specific label except on those vehicles labeled prior to the date that fuel economy labels are required to bear the range of fuel economy of comparable automobiles (specified in § 600.306(b)) or as permitted by the Administrator. The manufacturer shall submit for approval by the Administrator each typical label format exemplifying the intended representation of all information required on the fuel economy label as well as the size and color of print, and paper, and spacing and location of all printed information. After approval by the Administrator, the manufacturer may not change the label except as required for proper vehicle description, fuel economy values, and estimated annual fuel costs. Where the fuel economy label is incorporated with the Automobile Information Disclosure Act label, the above requirements pertain to that

section of the label reserved for fuel economy labeling.

(b) All vehicle descriptions, fuel economy values and annual fuel cost estimates intended for use on general and specific labels must be approved in advance by the Administrator. Fuel economy values are computed according to Subpart C from approved vehicle fuel economy results as determined under § 600.008.

§ 600.313–77 Timetable for data and information submittal and review.

(a) The Administrator will notify the manufacturer of the classification of each of the manufacturer's car lines after the manufacturer makes a request for such determination.

(b) Each fuel economy label format which the manufacturer intends to use must be approved by the Administrator before the manufacturer requests the Administrator to determine fuel economy values for use on that type of label. For example, a California general label format must be approved by the Administrator before the manufacturer requests California general label fuel economy values.

(c) If a manufacturer requests and submits sufficient information, the Administrator will determine, according to Subpart C, general label or specific label fuel economy values based upon information submitted by the manufacturer.

(1) A manufacturer must request general label fuel economy values and submit sufficient information to determine general fuel economy label values prior to a date established by the Administrator.

(2) As of the date of the request, the manufacturer may not submit additional information pertaining to this request except as required by the Administrator.

(3) After receipt of a manufacturer's request for computation of label values, the Administrator will review, according to § 600.008, the fuel economy submission received from the manufacturer and notify the manufacturer of approval or request further data, information, or vehicles in accordance with the approval procedure specified in Subpart A.

(4) After receipt of a manufacturer's data, information, or vehicles in response to paragraph (c) (3), the Administrator will conduct any testing and complete data review required under subparagraph (3), and notify the manufacturer of the results of this testing and review.

(5) After completion of any testing or review of the data which satisfy the requirements of paragraph (c) (3), the Administrator will provide the manufacturer with general label and/or specific label (as requested under this paragraph) fuel economy values, annual fuel cost estimates, and a range of fuel economy of comparable automobiles (when a range is available) as calculated from approved data. After receipt of approved fuel economy label values, the manufacturer may use these data in the labeling of his automobiles.

(6) The manufacturer should submit any request for approval of data under this section at least 25 working days before he desires the Administrator's response. This should allow the Administrator sufficient time to conduct any additional testing required.

§ 600.314–77 Updating fuel economy, annual fuel cost, and range of fuel economy for comparable automobiles.

(a) After the Administrator approves general label fuel economy values for a model type, those values will remain in effect for that model type for the remainder of the model year.

(b) After the Administrator approves specific label fuel economy values for a vehicle configuration, those values will remain in effect for that vehicle configuration for the remainder of the model year.

(c) Estimated annual fuel cost as determined in § 600.206 for specific labeled automobiles and in § 600.207 for general labeled automobiles incorporates factors for average annual miles driven and cost per gallon of fuel.

(1) These factors are determined by the Administrator early in the model year.

(2) These factors do not change during the model year.

(d) The Administrator will compute the range of fuel economy of comparable automobiles from the latest approved fuel economy values available at the time of label approval. Additionally, the Administrator will update the range of fuel economy of comparable automobiles for previously approved labels.

(1) The Administrator will initially make available a range of fuel economy of comparable automobiles for all approved general and specific labels in each class. The range will be made available on a date that coincides as closely as possible to the date of the general model year introduction for the industry.

(2) The Administrator will make available an updated range of fuel economy of comparable automobiles for all approved general and specific labels at any other appropriate date during the model year.

(3) The Administrator will communicate to the affected parties the dates referred to in paragraphs (d) (1) and (2).

§ 600.315–77 Classes of comparable automobiles.

(a) (1) The Administrator will classify passenger automobiles by car line into one of the following comparable classes, based on interior volume index or seating capacity:

(i) Two Seaters—A car line shall be classed as "Two Seaters" if the majority of the vehicles in that car line have no more than two designated seating positions as such term is defined in the regulations of the National Highway Traffic Safety Administration, Department of Transportation, 49 CFR 571.3.

(ii) Subcompact cars—Interior volume index less than 100 cubic feet.

(iii) Compact cars—Interior volume index greater than or equal to 100 cubic feet but less than 110 cubic feet.

(iv) Mid-Size cars—Interior volume index greater than or equal to 110 cubic feet, but less than 120 cubic feet.

(v) Large cars—Interior volume index greater than or equal to 120 cubic feet.

(vi) Small station wagons—Station wagons with interior volume index less than 130 cubic feet.

(vii) Mid-Size station wagons—Station wagons with interior volume index greater than or equal to 130 cubic feet and less than 160 cubic feet.

(viii) Large station wagons—Station wagons with interior volume index greater than or equal to 160 cubic feet.

(2) The Administrator will classify pickup trucks separately from other non-passenger automobiles. Pickup trucks will be separated by car line into one of the following classes by the Administrator on the basis of gross vehicle weight rating (GVWR). For pickup truck car lines with more than one GVWR, the GVWR of the pickup truck car line is the arithmetic average of all distinct GVWR's less than or equal to 6,000 pounds available for that car line.

(i) Small pickup trucks—Pickup trucks with a GVWR less than 4,500 pounds.

(ii) Standard pickup trucks—Pickup trucks with a GVWR of 4,500 pounds up to and including 6000 pounds.

(iii) Vans/Special purpose trucks—All non-passenger automobiles with GVWR less than or equal to 6,000 pounds which do not meet the requirements of (2) (i) or (ii).

(3) Once a certain car line is classified by the Administrator, the classification will remain in effect for the model year.

(b) Interior volume index—passenger automobiles.

(1) The interior volume index shall be calculated for each car line, which is not a "Two Seater" car line, in cubic feet rounded to the nearest 0.1 cubic feet. For car lines with more than one body style, the interior volume index for the car line is the arithmetic average of the interior volume indices of each body style in the car line.

(2) For all body styles except station wagons and hatchbacks with more than one seat (e.g., with a second or third seat) equipped with seat belts as required by DOT safety regulations, interior volume index is the sum, rounded to the nearest 0.1 cubic feet, of the front seat volume, the rear seat volume, if applicable, and the luggage capacity.

(3) For all station wagons and hatchbacks with more than one seat (e.g., with a second or third seat) equipped with seat belts as required by DOT safety regulations, interior volume index is the sum, rounded to the nearest 0.1 cubic feet, of the front seat volume, the rear seat volume and the cargo volume index.

(c) All interior and cargo dimensions are measured in inches to the nearest 0.1 inches. All dimensions and volumes shall be determined from the base vehicles of each body style in each carline and do not include optional equipment. The dimensions H61, W3, L34, H63, W4, L51, H201, L205, L208, L209, H197 and the volume V1 are to be determined in

accordance with the procedures outlined in Motor Vehicle Dimensions SAE J1100a (Report of Human Factors Engineering Committee, Society of Automotive Engineers, approved September 1973 and last revised September 1975) except as noted herein:

(1) SAE J1100a(2.3) Cargo Dimensions—all dimensions measured with the front seat positioned the same as for the interior dimensions and the second seat, for station wagons and hatchbacks, in the upright position. All head restraints shall be in the stowed position and considered part of the seat.

(2) SAE J1100a(8). Luggage Capacity—Total of volumes of individual pieces of standard luggage set plus H-boxes stowed in the luggage compartment in accordance with the procedure described in 8.2. For passenger automobiles with no rear seat or with a rear seat with no rear seat belts, the luggage compartment shall include the area to the rear of the front seat, with the rear seat (if applicable) folded, to the height of a horizontal plane tangent to the top of the front seatback.

(3) SAE J1100a(7). Cargo Dimensions.

(i) L208—Cargo length at second seatback height—hatchback. The minimum horizontal dimension from the "X" plane tangent to the rearmost surface of the second seatback to the inside limiting interference of the hatchback door on the zero "Y" plane.

(ii) L209—Cargo length at floor—second—hatchback. The minimum horizontal dimensions at floor level from the rear of the second seatback to the normal limiting interference of the hatchback door on the vehicle zero "Y" plane.

(iii) H197—Second seatback to load floor height. The dimension measured vertically from the horizontal tangent to the top of the second seatback to the undepressed floor covering.

(d) The front seat volume is calculated in cubic feet by dividing 1728 into the product of three terms:

(1) H61—Effective head room—front. (in inches, obtained according to paragraph (c)),

(2) W3—Shoulder room—front. (in inches, obtained according to paragraph (c)) and,

(3) L34—Maximum effective leg room—accelerator. (in inches, obtained according to paragraph (c)). Round the quotient to the nearest 0.001 cubic feet.

(e) The rear seat volume is calculated in cubic feet, for vehicles with a rear seat equipped with rear seat belts (as required by DOT) by dividing 1728 into the product of three terms:

(1) H63—Effective head room—second. (inches obtained according to paragraph (c)),

(2) W4—Shoulder room—second. (in inches, obtained according to paragraph (c)) and,

(3) L51—Minimum effective leg room—second. (in inches obtained according to paragraph (c)). Round the quotient to the nearest 0.001 cubic feet.

(f) The luggage capacity is V1, the usable luggage capacity obtained according to paragraph (c). For passenger automobiles with no rear seat, or with a rear seat but no rear seat belts, the area to the rear of the front seat shall be included in the determination of V1, usable luggage capacity, as outlined in paragraph (c).

(g) Cargo volume index:

(1) For station wagons the cargo volume index V2 is calculated in cubic feet, by dividing 1728 into the product of three terms:

(i) W4—Shoulder room—second. (in inches obtained according to paragraph (c)),

(ii) H201—Cargo height. (in inches obtained according to paragraph (c)) and,

(iii) L205—Cargo length at belt—second. (In inches obtained according to paragraph (c).) Round the quotient to the nearest 0.001 cubic feet.

(2) For hatchbacks, the cargo volume index V3 is calculated in cubic feet, by dividing 1728 into the product of three terms:

(i) Average cargo length, which is the arithmetic average of:

(*A*) L208—Cargo length at second seatback height—hatchback. (In inches obtained according to paragraph (c)) and,

(*B*) L209—Cargo length at floor—second—hatchback. In inches obtained according to paragraph (c));

(ii) W4—Shoulder room—second. (In inches obtained according to paragraph (c)) and;

(iii) H197—Second seat back to load floor height. (In inches obtained according to paragraph (c).) Round the quotient to the nearest 0.001 cubic foot.

(h) The following data must be submitted to the Administrator no later than the time of a general label request. Data shall be included for each body style in the carline covered by that general label.

(1) For all passenger automobiles:

(i) Dimensions H61, W3, L34 determined in accordance with paragraph (c).

(ii) Front seat volume determined in accordance with paragraph (d).

(iii) Dimensions H63, W4, L51 (if applicable) determined in accordance with paragraph (c).

(iv) Rear seat volume (if applicable) determined in accordance with paragraph (e).

(v) The interior volume index determined in accordance with paragraph (b) for:

(*A*) Each body style and,

(*B*) The car line.

(vi) The class of the car line as determined in paragraph (a).

(2) For all passenger automobiles except station wagons and hatchbacks with more than one seat (e.g., with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The quantity and letter designation of the pieces of the standard luggage set installed in the vehicle in the determination of usable luggage capacity V1 and,

(ii) The usable luggage capacity V1, determined in accordance with paragraph (f).

(3) For station wagons with more than one seat (e.g., with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The dimensions H201 and L205 determined in accordance with paragraph (c) and,

(ii) The cargo volume index V2 determined in accordance with paragraph (g)(1).

(4) For hatchbacks with more than one seat (e.g., with a second or third seat) equipped with seat belts as required by DOT safety regulations:

(i) The dimensions L208, L209, and H197 determined in accordance with paragraph (c) and,

(ii) The cargo volume index V3 determined in accordance with paragraph (g)(2).

(5) For Pickup trucks:

(i) All GVWR's of less than or equal to 6,000 pounds available in the car line.

(ii) The arithmetic average GVWR for the car line.

Subpart E—Fuel Economy Regulations for 1977 and Later Model Year Automobiles—Dealer Availability of Fuel Economy Information

§ 600.401–77 General applicability.

The provisions of this subpart are applicable to 1977 and later model year automobiles.

§ 600.402–77 Definitions.

The definitions in § 600.002 apply to this subpart.

§ 600.403–77 Abbreviations.

The abbreviations in § 600.003 apply to this subpart.

§ 600.404–77 Section numbering, construction.

The section numbering procedure specified in § 600.004 applies to this subpart.

§ 600.405–77 Dealer requirements.

(a) Each dealer shall prominently display at each location where new automobiles are offered for sale booklets containing the information specified in § 600.407. The dealer shall provide these booklets without charge and in sufficient quantity to be available for retention by each prospective purchaser upon his request. The dealer will be expected to make these booklets available as soon as they are received by the dealer, but in no case later than 15 working days after notification is given of booklet availability.

(b) The dealer shall display these booklets in the same manner and in each location used to display brochures describing the automobiles offered for sale by the dealer. The display shall include information that similar booklets containing the EPA fuel economy information are also available through the mail by writing to Fuel Economy, Pueblo, California 81009.

(c) The dealer shall display the booklet applicable to each model year auto-

mobile offered for sale at the location. If, as described in § 600.406, a regional edition of the booklet is prepared for California automobiles:

(1) Each dealer who offers automobiles for sale at a location within the State of California shall display the California regional edition of the booklet.

(2) Each dealer who offers automobiles for sale at locations outside the State of California, and expects that at least 50 percent of the automobiles eventually sold at the location during the model year will be California configurations, shall display the California regional edition of the booklet. These dealers may also display the national edition of the booklet provided both editions are displayed with equal prominence.

§ 600.406–77 Distribution of booklet information.

(a) Each dealer will be provided with a sufficient quantity of booklets to fulfill his obligations under § 600.405(a) by:

(1) The U.S. Federal Energy Administration or

(2) Any other source.

(b) If the Administrator determines that automobiles intended for sale in the state of California are likely to exhibit significant differences in fuel economy from those offered for sale in other states, he will prepare a California edition of the booklet, and the Federal Energy Administration will distribute the California edition of the booklet as provided in this part.

§ 600.407–77 Booklets displayed by dealers.

(a) Booklets displayed by dealers in order to fulfill the obligations of 600.405 may be either the Gas Mileage Guide published by the FEA Administrator or a booklet approved by the Administrator of EPA containing the same information, format, and order as the booklet published by the FEA Administrator.

(b) The booklet may highlight the dealer's product line by contrasting color of ink or boldface type and may include other supplemental information regarding the dealer's product line subject to approval by the Administrator.

(c) A manufacturer's name and logo or a dealer's name and address or both may appear on the back cover of the booklet.

Subpart G—Fuel Economy Regulations for 1977 Model Year Automobiles—Test Procedures

§ 600.601–77 General applicability.

The provisions of this subpart are applicable to 1977 model year automobiles.

§ 600.602–77 Definitions.

The definitions in § 600.002 apply to this subpart.

§ 600.603–77 Abbreviations.

The abbreviations in § 600.003 apply to this subpart.

§ 600.604–77 Section numbering, construction.

The model year of initial applicability is indicated by the section number. The two digits following the hyphen designate the model year for which a section is effective.

§ 600.605–77 Record keeping.

The record keeping requirements set forth in § 600.005 apply to this subpart.

§ 600.606–77 Equipment requirements.

The requirements for test equipment to be used for all fuel economy testing are given in §§ 86.177–16 and 86.177–17, as applicable.

§ 600.607–77 Fuel specifications.

(a) The test fuel specifications for gasoline-fueled automobiles are given in § 86.177–6(a)(1).

(b) The test fuel specifications for diesel automobiles are given in § 86.177–6(b) (1) and (2).

§ 600.608–77 Analytical gases.

The analytical gases for all fuel economy testing must meet the criteria specified in § 86.177–19.

§ 600.609–77 EPA driving cycles.

(a) The driving cycle to be utilized for generation of the city fuel economy data is prescribed in § 86.177–10.

(b) The driving cycle to be utilized for generation of the highway fuel economy data is specified in this paragraph.

(1) The Highway Fuel Economy Driving Schedule is Appendix I. The driving schedule is defined by a smooth trace drawn through the specific speed versus time relationships.

(2) The speed tolerance at any given time on the dynamometer driving schedule specified in Appendix I, or as printed on a driver's aid chart approved by the Administrator, when conducted to meet the requirements of § 600.611(b) is defined by upper and lower limits. The upper limit is 2 mph higher than the highest point on the trace within 1 second of the given time. The lowest limit is 2 mph lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(3) A graphic representation of the range of acceptable speed tolerances is found in Appendix I to Part 86.

§ 600.610–77 Equipment calibration.

The equipment used for fuel economy testing must be calibrated according to the provisions of § 86.177–19.

§ 600.611–77 Test procedures.

(a) The test procedures to be followed for generation of the city fuel economy data are those prescribed in Subpart B of Part 86 as applicable. (The evaporative loss portion of the test procedure may be omitted unless specifically required by the Administrator pursuant to 40 CFR 86.)

(b) The test procedures to be followed for generation of the highway fuel economy data are those specified in § 600.611 (b) through (h) inclusive.

(1) The Highway Fuel Economy Dynamometer Procedure consists of a preconditioning highway driving sequence and a measured highway driving sequence.

(2) The highway fuel economy test is designed to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stops per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emissions is collected continuously for subsequent analysis using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously analyzed for hydrocarbons using a heated sample line and analyzer.

(3) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle must be functioning during all procedures in this subpart. The Administrator may authorize maintenance to correct component malfunction or failure.

(c) Transmissions—The provisions of §§ 86.177–12 through 86.177–14 inclusive apply for vehicle transmission operation during highway fuel economy testing under this subpart.

(d) Road Load Power and Inertia Weight Determination—Section 86.177–11 applies for determination of road load power and inertia weight for highway fuel economy testing.

(e) *Vehicle Preconditioning*—The Highway Fuel Economy Dynamometer Procedure is designed to be performed immediately following the Federal Emission Test Procedure, (Subpart B of Part 86). When conditions allow, the tests should be scheduled in this sequence. In the event tests cannot be scheduled within three hours of the Federal Emission Test Procedure (including the one hour hot soak evaporative loss test, if applicable) the vehicle should be preconditioned as follows:

(1) If the vehicle has experienced between three (3) and twenty-four (24) hours of soak (68°–86°F) since the completion of the Federal Emission Test Procedure, the vehicle must be preconditioned by running 50 mph on the dynamometer for 5 minutes, followed by the Highway Fuel Economy Dynamometer Procedure described in paragraph (f).

(2) If the vehicle has experienced more than 24 hours of soak (68°–86°F) since the completion of the Federal Emission Test Procedure, or periods of storage outdoors, or in environments where soak temperature is not controlled to 68°–86°F, the vehicle must be preconditioned by running one hour on the Road Preconditioning Route, (§ 86.177–8(a)(1)) and one cycle of the EPA Urban Dynamometer Driving Schedule (§ 86.177–10) followed by the Highway Fuel Economy Dynamometer Procedure-paragraph (f).

(f) *Highway Fuel Economy Dynamometer Procedure.* (1) The dynamometer procedure consists of two cycles of

the Highway Fuel Economy Driving Schedule (§ 600.609–77(b)) separated by 15 seconds of idle. The first cycle of the Highway Fuel Economy Driving Schedule is driven to precondition the test vehicle and the second is driven for the fuel economy measurement.

(2) The provisions of § 86.177–11 (b), (c), (d), (e), (f), (h), and (j) apply for fuel economy testing, except that the test vehicle may be used for dynamometer horsepower adjustment.

(3) Only one exhaust sample and one background sample are collected and analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, and carbon dioxide.

(4) The fuel economy measurement cycle of the test includes two seconds of idle indexed at the beginning of the second cycle and two seconds of idle indexed at the end of the second cycle.

(g) *Engine Starting and Restarting.* (1) If the engine is not operating at the initiation of the highway fuel economy test (preconditioning cycle), the start-up procedure must be according to the manufacturer's recommended procedures.

(2) False starts and stalls during the preconditioning cycle must be treated as in § 86.177–15 (d) and (e). If the vehicle stalls during the measurement cycle of the highway fuel economy test, the test is voided, corrective action may be taken, and the vehicle may be rescheduled for testing. The person taking corrective action shall report the action so that the test records for the vehicle contain a record of the action.

(h) Dynamometer Test Run—The following steps must be taken for each test:

(1) Place the drive wheels of the vehicle on the dynamometer. The vehicle may be driven onto the dynamometer.

(2) Open the vehicle engine compartment cover and position the cooling fan(s) as required. Manufacturers may request the use of additional cooling fans for additional engine compartment or under-vehicle cooling and for controlling high tire or brake temperatures during dynamometer operation.

(3) Preparation of the CVS must be performed before the measurement highway driving cycle.

(4) Equipment preparation—The provisions of § 86.177–20(b) (3) through (6) inclusive apply for the highway fuel economy test except that only one exhaust sample collection bag and one dilution air sample collection bag need be connected to the sample collection systems.

(5) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.609 (b).

(6) When the vehicle reaches zero speed at the end of the preconditioning cycle, the driver has 13 seconds to prepare for the emission measurement cycle of the test.

(7) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.609(b) while sampling the exhaust gas.

(8) Sampling must begin two seconds before beginning the first acceleration of the fuel economy measurement cycle and must end two seconds after the end of the deceleration to zero.

§ 600.612–77 Exhaust sample analysis.

The exhaust sample analysis must be performed according to § 86.177–19(b).

§ 600.613–77 Fuel economy calculations.

The calculations of vehicle fuel economy values require the weighted grams/mile values for HC, CO, and CO_2 for the city fuel economy test and the grams/mile values for HC, CO, and CO_2 for the highway fuel economy test. The city and highway fuel economy values must be calculated by the procedures of this section. A sample calculation appears in Appendix II.

(a)(1) Calculate the weighted grams per mile values for the city fuel economy test for HC and CO by the method in § 86.177–22.

(2) Calculate the weighted CO_2 grams per mile value for the city fuel economy test according to the procedure in this subparagraph.

(A) Calculate the CO_2 concentration of the dilute exhaust sample corrected for background, CO_2 conc:

$$CO_2\ \text{conc} = CO_{2_e} - CO_{2_d}(1 - 1/DF)$$

where:

CO_{2_e} = CO_2 concentration of the dilute exhaust sample as measured in molar percent

CO_{2_d} = CO_2 concentration of the dilution air as measured in molar percent

DF = Dilution factor calculated according to § 86.177–22

(B) Calculate the CO_2 mass for each of the phases of the cold start and hot start tests:

$$CO_{2\,mass} = V_{mix} \times \text{Density}_{CO_2} \times (CO_2\ \text{conc})/100$$

where:

$CO_{2\,mass}$ = Mass of CO_2 per test phase, in grams per test phase

V_{mix} = Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528° R (293°K) and 760 mm Hg (101.3 kPa)). Calculate this quantity by the procedure contained in § 86.177–22.

Density_{CO_2} = Density of CO_2 corrected to standard conditions in grams per cubic foot. This value is 51.85 gm/ft³.

(C) Calculate the weighted CO_2 grams per mile mass emissions:

$$[CO_2]_{wm} = (0.43[CO_2]_{ct} + 0.57[CO_2]_{ht} + [CO_2]_s)/7.5.$$

where:

$[CO_2]_{wm}$ = Weighted CO_2 grams per mile mass emissions

$[CO_2]_{ct}$ = CO_2 mass calculated from the "transient" phase of the cold start test, in grams per test phase

$[CO_2]_{ht}$ = CO_2 mass calculated from the "transient" phase of the hot start test, in grams per test phase

$[CO_2]_s$ = CO_2 mass calculated from the "stabilized" phase of the cold start test, in grams per test phase

(b)(1) Calculate the mass values for the highway fuel economy test for HC and CO as specified in § 86.177–22(b). Calculate the mass values for the highway fuel economy test for CO_2 as specified in paragraph (a)(2)(B) of this section.

(2) Calculate the grams/mile values for the highway fuel economy test for HC, CO, and CO_2 by dividing the mass values obtained in (b)(1) by 10.242 miles.

(c) Calculate the city fuel economy and highway fuel economy values from the grams/mile values for HC, CO, and CO_2. The HC values (obtained per paragraph (a) or (b) as applicable) used in each calculation in this section are rounded to the nearest 0.01 grams/mile. The CO values (obtained per paragraph (a) or (b) as applicable) used in each calculation in this section are rounded to 0.1 grams/mile. The CO_2 values (obtained per paragraph (a) or (b) as applicable) used in each calculation in this section are rounded to the nearest gram/mile.

(d) For gasoline-fueled automobiles, calculate the fuel economy in miles per gallon of gasoline by dividing 2421 by the sum of three items:

(1) 0.866 multiplied by HC (in grams/mile as obtained in paragraph (c)),

(2) 0.429 multiplied by CO (in grams/mile as obtained in paragraph (c)), and

(3) 0.273 multiplied by CO_2 (in grams/mile as obtained in paragraph (c)).

Round the quotient to the nearest 0.1 mile per gallon.

(e) For diesel powered automobiles, calculate the fuel economy in miles per gallon of diesel fuel by dividing 2778 by the sum of three terms:

(1) 0.866 multiplied by HC (in grams/mile as obtained in paragraph (c)),

(2) 0.429 multiplied by CO (in grams/mile as obtained in paragraph (c)), and

(3) 0.273 multiplied by CO_2 (in grams/mile as obtained in paragraph (c)).

Round the quotient to the nearest 0.1 mile per gallon.

APPENDICES

Appendices I and II were published as part of the rule making, "Fuel Economy Testing for 1978 Model Year Automobiles and Calculation Procedures for 1977 and Subsequent Model Year Automobiles; Exhaust Emission Test Procedures for 1978 Model Year Automobiles and Light Duty Trucks," 41 FR 38674, September 10, 1976.

APPENDIX III.—SAMPLE FUEL ECONOMY LABEL CALCULATION (1977 MODEL YEAR)

Suppose that a manufacturer called Mizer Motors has a product line composed of eight car lines. Of these eight, four are available with the 300 CID, 2 barrel, non-catalyst, 49-state engine. These four car lines are:

Ajax

Boredom III

Dodo

Castor (Station Wagon)

A car line is defined in Subpart A as a group of vehicles within a make or division which has a degree of commonality in construction. Car line does not consider any level of decor or opulence and is not generally distinguished by such characteristics as roofline, number of doors, seats, or windows. Station wagons and light duty trucks are, however, identified separately from the remainder of each car line. In other words, a Castor station wagon would be considered a different car line than the normal Castor car line made up of sedans, coupes, etc.

The engine considered here is defined as a basic engine in Subpart A. A basic engine is a unique combination of fuel system, number of cylinders, catalyst usage, and engine displacement.

A model type is a unique combination of car line, basic engine, and transmission class. Thus Ajax is a car line but Ajax 300–2V non-catalyst, 49-state, manual transmission is a model type whereas Ajax 300–2V non-catalyst, 49-state, automatic transmission is a different model type.

The following calculations provide an example of the procedures described in Subpart C of this part for the calculation of vehicle configuration and model type fuel economy values. In order to simplify the presentation, only city fuel economy values are included. The procedure is identical for highway and combined fuel economy values.

Step I. *Input data as supplied by the manufacturer or as determined from testing conducted by the Administrator.*
Manufacturer—Mizer Motors.
Basic Engine: (300-2 barrel, 8-cylinder, non-catalyst, 49 state).

Test vehicle carline	Engine code	Transmission	Inertia weight	Axle ratio	Average miles per gallon	Label miles per gallon [1]	Vehicle configuration sales
Ajax	1	M-3	3,500	2.73	16.1001	16	15,000
Do	2	A-3	3,500	2.56	15.9020	16	35,000
Boredom III	4	M-3	4,000	3.08	14.2343	14	10,000
Ajax	3	M-4	4,000	3.36	15.0000	15	15,000
Boredom III	8	A-3	4,000	2.56	13.8138	14	25,000
Do	5	A-3	4,500	3.08	13.2203	13	20,000
Castor	5	A-3	5,000	3.08	10.6006	11	40,000

[1] The vehicle configuration fuel economy values, rounded to the nearest mile per gallon, are the fuel economy values that would be used on specific labels for that vehicle configuration.

Step II. *Group vehicle fuel economy and sales data according to base level combinations within this basic engine.*

	Transmission	Inertia weight	Miles per gallon	Projected vehicle configuration sales
Base level:				
A	Manual-3	3,500	16.1001	15,000
B	Automatic	3,500	15.9020	35,000
C	Manual-3	4,000	14.2343	10,000
C	Manual-4	4,000	15.0000	15,000
D	Automatic	4,000	13.8138	25,000
E	do	4,500	13.2203	20,000
F	do	5,000	10.6006	40,000

Step III. *Determine base level fuel economy values.*
A. For all the base levels except the base level which includes 4,000 pound, manual transmission data, the base level fuel economy is as noted in Step II since only one vehicle configuration was tested within each of these base levels.

	Miles per gallon
3,500 lb/manual transmission	16.1001
3,500 lb/automatic transmission	15.9020
4,000 lb/automatic transmission	13.8138
4,500 lb/automatic transmission	13.2203
5,000 lb/automatic transmission	10.6006

B. Since data from more than one vehicle configuration are included in the 4,000-pound, manual transmission base level, this fuel economy is harmonically averaged in proportion to the percentage of total sales of all vehicle configurations tested within that base level represented by each vehicle configuration tested within that base level.

$$\text{Base level fuel econ.} = \frac{1}{\left[\begin{array}{l}\text{Fraction of total sales of configurations tested represented by configuration No. 1 sales}\end{array}\right]\left[\begin{array}{l}\frac{1}{\text{Configuration No. 1 fuel economy}}\end{array}\right] + \left[\begin{array}{l}\text{Fraction of total sales of configurations tested represented by configuration No. 2 sales}\end{array}\right]\left[\begin{array}{l}\frac{1}{\text{Configuration No. 2 fuel economy}}\end{array}\right] + \cdots}$$

Base Level: Manual, 4,000 pounds.

$$\frac{1}{\left[\frac{10000}{25000}\right]\frac{1}{14.2343} + \left[\frac{15.000}{250000}\right]\frac{1}{15.0000}} = 14.6840 \text{ mi/gal}$$

Therefore, the 4,000 pound/manual-transmission fuel economy is 14.6840 mi/gal.

4,000 pound/manual transmission = 14.6840 mi/gal

Note that the car line of the test vehicle using a given engine makes no difference—only the weight and transmission do.

Step IV. *For each model type offered by the manufacturer with that basic engine, determine the sales fraction represented by each inertia weight/transmission class combination and the corresponding fuel economy.*

Ajax:		
Manual	1.0000 at 3,500 lb	16.1001
Automatic	0.3000 at 3,500 lb	15.9020
	0.7000 at 4,000 lb	13.8138
Dodo:		
Manual	0.4000 at 3,500 lb	16.1001
	0.6000 at 4,000 lb	14.6840
Automatic	0.3000 at 3,500 lb	15.9020
	0.7000 at 4,000 lb	13.8138
Boredom III:		
Manual	1.0000 at 4,000 lb	14.6840
Automatic	0.2500 at 4,000 lb	13.8138
	0.7500 at 4,500 lb	13.2203
Castor:		
Automatic	0.2000 at 4,500 lb	13.2203
	0.8000 at 5,000 lb	10.6006

Step V. *Determine fuel economy for each model type (that is, car line/basic engine/transmission class combination).*

Ajax, 300-2 barrel, automatic, MPG =

$$\frac{1}{\frac{\text{The fraction of Ajax vehicles using the 300-2 bbl, engine which fall in the 3,500 lb inertia weight class with an automatic transmission.}}{\text{Fuel economy for 300-2 bbl, 3,500 lb automatic transmission base level.}} + \frac{\text{The fraction of Ajax vehicles using the 300-2 bbl, engine which fall in the 4,000 lb inertia weight class with an automatic transmission.}}{\text{Fuel economy for 300-2 bbl, 4,000 lb automatic transmission base level.}}} = \frac{1}{14.3803}$$

$$\text{Ajax, 300-2 barrel, automatic, MPG} = \frac{1}{\frac{0.3000}{15.9020} + \frac{0.7000}{13.8138}}$$

Similarly,

Ajax, 300-2 barrel, manual MPG = 16.1 16 MPG [1]

$$\text{Dodo, 300-2 barrel, manual MPG} = \frac{1}{\frac{0.4000}{16.1001} + \frac{0.6000}{14.6840}} = 15.2185, 15 \text{ mi/gal}^{1}$$

$$\text{Dodo, 300-2 barrel, automatic MPG} = \frac{1}{\frac{0.3000}{15.9020} + \frac{0.7000}{13.8138}} = 14.3803, 14 \text{ mi/gal}^{1}$$

Boredom III, 300-2 barrel, manual MPG = 14.6840, 15 mi/gal[1]

$$\text{Boredom III, 300-2 barrel, automatic MPG} = \frac{1}{\frac{0.2500}{13.8138} + \frac{0.7500}{13.2203}} = 13.3638, 13 \text{ mi/gal}^{1}$$

$$\text{Castor, 300-2 barrel, automatic MPG} = \frac{1}{\frac{0.2000}{13.2203} + \frac{0.8000}{10.6006}} = 11.0381, 11 \text{ mi/gal}^{1}$$

Note that even though no Dodo was actually tested, this approach permits its fuel economy figure to be estimated, based on the inertia weight distribution of projected Dodo sales within a specific engine and transmission grouping.

[1] The model type fuel economy values, rounded to the nearest mile per gallon, are the fuel economy values as used on general labels for that model year.

APPENDIX IV.—SAMPLE FUEL ECONOMY LABEL FORMATS

The following sample fuel economy labels represent formats and language which would be approved by the Administrator for various labeling schemes. Of course, the actual vehicle description, vehicle class, fuel economy values, and annual fuel costs would correspond to the appropriate information approved for the labeled vehicle. Additionally, the range of combined fuel economy, the effective date of the range, the fuel cost per gallon, and the miles driven per year would be as specified by the Administrator at the time of label approval.

GENERAL LABEL
WITH RANGE

Based on the results of tests conducted or certified by the U.S. ENVIRONMENTAL PROTECTION AGENCY, the typical gas mileage of this car is estimated to be:

Federal Energy Administration

Vehicle: Ajax, 8-cylinder, 300 cubic inch displacement, 2 barrel carburetor, automatic transmission, catalyst equipped

10 MILES PER GALLON FOR CITY DRIVING
16 MILES PER GALLON FOR HIGHWAY DRIVING
AND
12 MILES PER GALLON FOR COMBINED CITY AND HIGHWAY DRIVING

As of September 17, 1976, the combined city and highway fuel economy for other Large vehicles ranged from 8 to 20 miles per gallon.

Based on $0.65 per gallon, 15,000 miles driven per year, and an average combined fuel economy of 12 miles per gallon, the estimated annual fuel cost for this vehicle is $812.

These estimates are based on tests of vehicles equipped with frequently purchased optional equipment.

Reminder: The actual fuel economy of this car will vary depending on the type of driving you do, your driving habits, how well you maintain your vehicle, optional equipment installed and used, and road and weather conditions.

To compare the fuel economy of this car with other 1977 cars, and to learn how the tests were conducted, ask your dealer for a free copy of the EPA/FEA 1977 Gas Mileage Guide.

GENERAL LABEL
WITHOUT RANGE

Based on the results of tests conducted or certified by the U.S. ENVIRONMENTAL PROTECTION AGENCY, the typical gas mileage of this car is estimated to be:

Federal Energy Administration

Vehicle: Ajax, 8 cylinder, 300 cubic inch displacement, 2 barrel carburetor, automatic transmission, catalyst equipped

10 MILES PER GALLON FOR CITY DRIVING
16 MILES PER GALLON FOR HIGHWAY DRIVING
AND
12 MILES PER GALLON FOR COMBINED CITY AND HIGHWAY DRIVING

As of the date this vehicle was built (or imported), a range of combined city and highway fuel economy for large vehicles was not available.

Based on $ 0.65 per gallon, 15,000 miles driven per year, and an average combined fuel economy of 14 miles per gallon, the estimated annual fuel cost for this vehicle is $812.

These estimates are based on tests of vehicles equipped with frequently purchased optional equipment.

Reminder: The actual fuel economy of this car will vary depending on the type of driving you do, your driving habits, how well you maintain your vehicle, optional equipment installed and used, and road and weather conditions.

To compare the fuel economy of this car with other 1977 cars, and to learn how the tests were conducted, ask your dealer for a free copy of the EPA/FEA 1977 Gas Mileage Guide.

GENERAL LABEL
CALIFORNIA

Based on the results of tests conducted or certified by the U.S. ENVIRONMENTAL PROTECTION AGENCY, the typical gas mileage of this car is estimated to be:

Federal Energy Administration

Vehicle: Ajax, 8 cylinder, 300 cubic inch displacement, 2 barrel carburetor, automatic transmission, catalyst equipped, California emission control system.

10 MILES PER GALLON FOR CITY DRIVING
16 MILES PER GALLON FOR HIGHWAY DRIVING
AND
12 MILES PER GALLON FOR COMBINED CITY AND HIGHWAY DRIVING

As of September 17, 1976, the combined city and highway fuel economy for other Large vehicles ranged from 8 to 20 miles per gallon.

Based on $0.65 per gallon, 15,000 miles driven per year, and an average combined fuel economy of 12 miles per gallon, the estimated annual fuel cost for this vehicle is $812.

These estimates are based on tests of vehicles equipped with frequently purchased optional equipment.

Reminder: The actual fuel economy of this car will vary depending on the type of driving you do, your driving habits, how well you maintain your vehicle, optional equipment installed and used, and road and weather conditions.

To compare the fuel economy of this car with other 1977 cars, and to learn how the tests were conducted, ask your dealer for a free copy of the EPA/FEA 1977 Gas Mileage Guide.

SPECIFIC LABEL
WITH RANGE

Based on the results of tests conducted or certified by the U.S. ENVIRONMENTAL PROTECTION AGENCY, the typical gas mileage of this car is estimated to be:

Federal Energy Administration

Vehicle: Ajax, 8 cylinder, 300 cubic inch displacement, 2 barrel carburetor, automatic transmission, catalyst equipped, 4,000 pounds test weight, 3.02 axle ratio.

10 MILES PER GALLON FOR CITY DRIVING
16 MILES PER GALLON FOR HIGHWAY DRIVING
AND
12 MILES PER GALLON FOR COMBINED CITY AND HIGHWAY DRIVING

THESE FUEL ECONOMY NUMBERS ARE FROM TESTS OF THIS VEHICLE CONFIGURATION AND MAY NOT BE IN THE EPA/FEA BUYER's GUIDE.

As of September 17, 1976, the combined city and highway fuel economy for other large vehicles ranged from 8 to 20 miles per gallon. The range on this label is based upon average fuel economy results, and does not reflect the range of tests of specific vehicle configurations.

Based on $ 0.65 per gallon, 15,000 miles driven per year, and an average combined fuel economy of 12 miles per gallon, the estimated annual fuel cost for this vehicle is $812.

These estimates are based on tests of vehicles equipped with frequently purchased optional equipment.

Reminder: The actual fuel economy of this car will vary depending on the type of driving you do, your driving habits, how well you maintain your vehicle, optional equipment installed and used, and road and weather conditions.

To compare the fuel economy of this car with other 1977 cars, and to learn how the tests were conducted, ask your dealer for a free copy of the EPA/FEA 1977 Gas Mileage Guide.

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